The Newspaper of Information Systems Management
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COMPUTERWORLD

SKILLS SCRAMBLE

CARY HENRIE

"You try to build a culture that people want to be part of, but it's hard when someone else is offering them a 30% jump in salary." — *Jim Kinney, CIO, Kraft General Foods*

- IS managers are paying sizable salary premiums — in some cases more than 35% — to hire and retain good people.
- Turnover rates are rising, a fact some managers attribute to an increasingly mercenary streak in talented programmers.
- The skills gap is forcing managers to spend more time on personnel matters such as hiring, training and retention.

What's an IS manager to do when salaries for some skills are in the stratosphere and competition for talent is cutthroat?

See "Good Help Gets Harder to Find" in Management, page 100.

PC server central

Microsoft's $99 tool consolidates NT, NetWare management

By Laura DiDio

Microsoft Corp. will broaden the connectivity between its Windows NT Server and archrival NetWare at Comdex/Fall '95 this week when it showcases a $99 software utility said to centrally manage Novell, Inc. servers from within NT.

Microsoft's Directory Services Manager for NetWare is slated to ship in the next several weeks, according to early beta testers. It is the latest in a series of five software utilities that forge transparent links between the Windows NT Server and NetWare environments.

This connection is becoming critical as the number of Windows NT Server installations in NetWare shops rapidly increases. The availability of the directory manager utility could also lure some users away from NetWare and toward NT, analysts said.

Mission control

The directory manager is an NT-based utility that lets network administrators centrally manage and consolidate user account information about NetWare file servers on the NT server.

The utility provides end users with a single log-on and password to both environments. Also appealing to businesses is that it doesn't require any software changes or additions to the NetWare server.

The product is the first utility that allows users to integrate NetWare and Windows NT Server account information on one central file server. Novell's NetSync utility, which runs as a NetWare Loadable Module on top of NetWare, supports directory synchronization between only NetWare 3.x and NetWare 4.x servers. It doesn't provide links to any other network operating system environment, a Novell spokeswoman said.

"Directory Services Manager for NetWare has been running so well that we put it in a production network even though we still only have the beta

Microsoft, *page 159*

Underground tools aid fledgling hackers

By Mitch Wagner and Gary H. Anthes

Looking for a software kit to walk you through the takeover of a corporate information system? A user-friendly, point-and-click package for hacking a telephone system? An automated Unix utility to break in to computers over the Internet?

These tools and more are available now on underground Internet sites and pirate bulletin boards. It's enough to keep an IS manager awake at night.

Computer piracy tools — just like legitimate software — are undergoing a revolution in automation and ease of use. The new generation of tools allow even the most simple-minded fledgling cyberpunk to break in to sophisticated systems, and they can turn a journeyman pirate into a true console cowboy.

"We've seen many cases of individuals with absolutely no idea what they're doing using very sophisticated methods to break in to systems," said Gene Spafford, associate professor at the Computer Operations Audit Security Technology lab at Purdue University in West Lafayette, Ind. "They'll find a program that people had posted and use it to get onto a system. They'll get onto a supercomputer running Unix and

Hackers, *page 159*

Security flaws

A recent security survey turned up some chilling information

85%	of users aren't required to change passwords frequently
23%	of users had passwords that were easy to guess
21%	of systems required no passwords at all
14%	of user IDs were inactive

Base: 172 sites

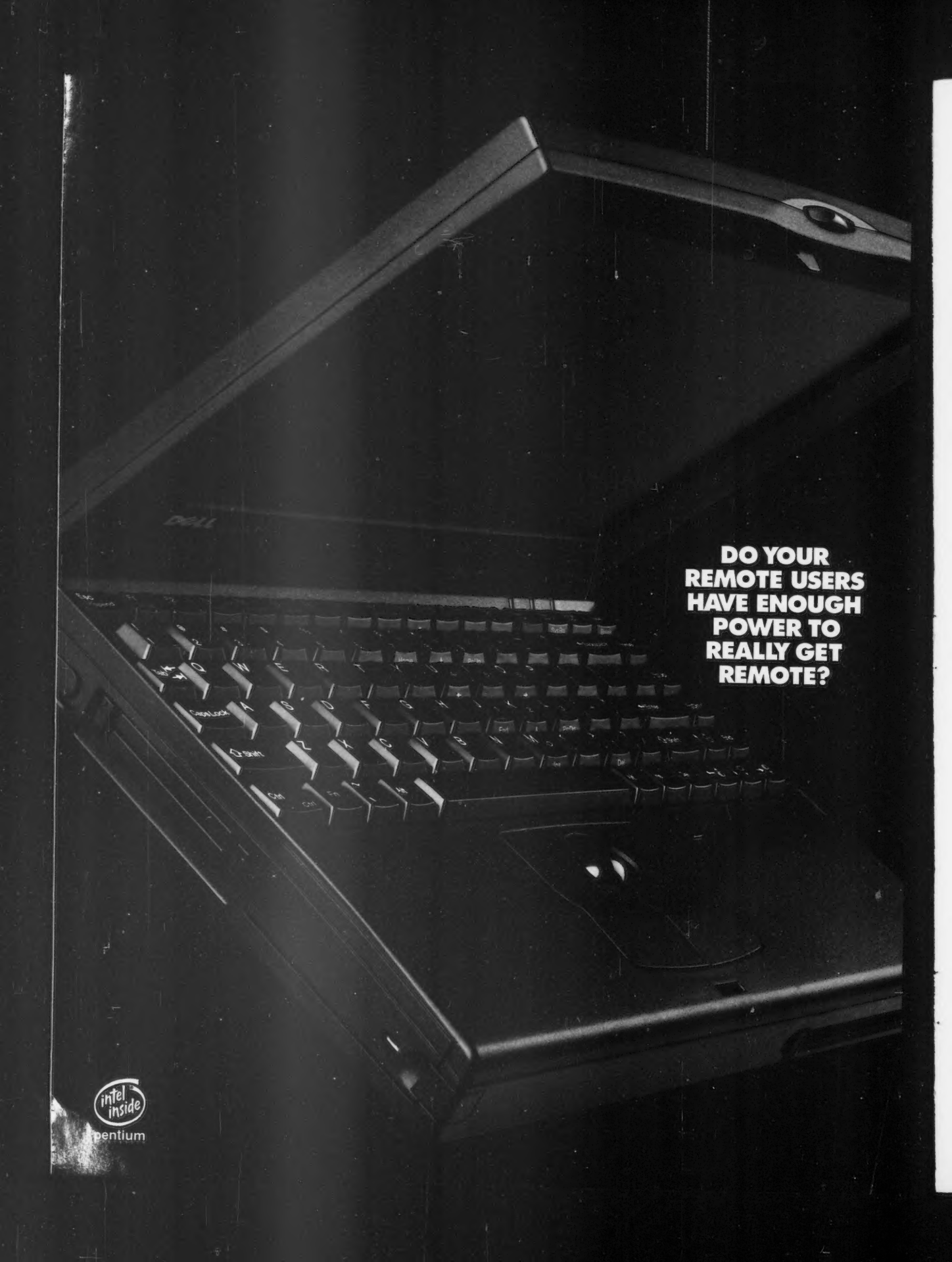
Source: Intrusion Detection, Inc., New York

Comdex/FALL '95

CHRIS SIMONS

- The CW Guide to High-End Desktop PCs takes the mystery out of PC purchasing. **Pages 111-128.** And for a report on diving PC prices, see **Page 151.**
- It's show time on the show floor. We give a rundown on the main attractions and even offer an on-line out for the wanna-be attendee. **Pages 14 and 15.**
- Not that it'll come as a surprise, but software and hardware exhibits will revolve around the Pentium chip and Windows environments. **Pages 1, 12 and 16.**

Newspaper


DO YOUR REMOTE USERS HAVE ENOUGH POWER TO REALLY GET REMOTE?
intel inside
pentium

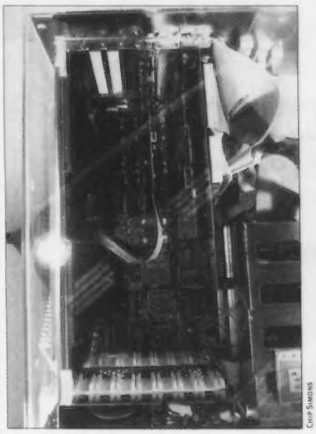
Chris Simons

The CW Guide to High-end PCs

There's more to high-end PCs than just speed and seductive technology. Users offer some definite "do's" and downright "don'ts" to help you make the best selection (and chasing speed is a strong don't). In our Buyers' Satisfaction Scorecard, strengths such as reliability and reputation gave Compaq the best "overall satisfaction" score.

Compaq users gave a whopping overall satisfaction rating of 70%, while IBM followed with 63%, Dell with 58% and HP with 53%.

For the complete package, see page 111



Chris Simons

Win 95 apps arrive

Users seek ways to manage mixed Windows shops

By Cheryl Gerber

If you can't stand to hear another word about Windows 95, you might want to skip Comdex/Fall '95 this week.

Keeping the spotlight on Microsoft Corp.'s 32-bit operating system will be a wave of about 75 software companies touting Windows 95 versions of various desktop applications. Booth demonstrations will target attendees scouring the halls for ways to manage or augment their increasingly mixed and Microsoft-dominated 16- and 32-bit desktop environments.

Helping to fuel Microsoft's momentum are early reports from WordPerfect users who are unhappy at the prospect of Novell, Inc. selling off that product line; most interviewed by *Computerworld* said they will probably jump to Microsoft.

And there is more good news for Microsoft. Under the glaring Las Vegas lights, ominous clouds may loom for Apple Computer, Inc. A SoftTracks Software Research market model of estimated 1995 desktop operating system and application shipments "shows the second-largest platform for developers after Windows is no longer the Macintosh," said SoftTracks principal Chris Le Tocq. "It's Microsoft Office."

At least one industry analyst said the battle is pretty much over. "The hearts and minds and even the souls of the PC development community are clearly down the Windows 95 path in practically every area now," said Bill Caffery, vice president for advanced technologies at Gartner Group, Inc. in Stamford, Conn.

The focus for many users will be on how to get the mixed Microsoft DOS, Windows 3.1, Windows 95 and Windows NT environments under control.

"We're looking for enterprise management tools for multiple Windows operating systems across multiple server platforms. We've got 1,500 us-

Win 95, *page 16*

Microsoft slowly gaining IS respect in enterprise

By Stuart J. Johnston, Julia King and Jean S. Bozman

COMPUTERWORLD SPECIAL REPORT

Microsoft in the Enterprise

Second of a two-part series

Despite its five-year crusade to break out of the PC desktop arena and into the big top of enterprise computing, Microsoft Corp. appears to have the same problem as Rodney Dangerfield. It just can't seem to get much respect.

That is changing gradually, some users said, partly because Microsoft officials have finally begun to admit they don't already know everything.

In fact, several corporate customers commented that one of the most visible differences between Microsoft's Business Systems Division, home of Windows NT and the company's server applications, and other company divisions, where bright young faces dominate, is the higher percentage of so-called "gray beards."

Indeed, Microsoft executives unanimously admit they still have a lot to learn about how IS does business.

"Although we can't say that most

Gaining IS respect, *page 28*

PowerPC goes CHRP

Alliance rolls out final draft standard

By Jaikumar Vijayan and Lisa Picarille

Much like the old Rod Stewart song, the PowerPC alliance is hoping this week to give Comdex-goers a reason to believe.

The alliance will showcase the first prototype desktop system based on the Common Hardware Reference Platform (CHRP), which is a standard blueprint for a PowerPC machine that can run multiple operating systems.

RISC platforms

The long-awaited, final draft specification of the CHRP standard, which has been in the works for a year, will also be released at Comdex, sources close to the alliance said. This means CHRP-compliant systems will become available by the third quarter of next year, the sources said.

The goal of the PowerPC alliance is to promote RISC architectures across a variety of hardware platforms, using chips developed by IBM and Motorola, Inc. Apple Computer, Inc., IBM and Motorola head the alliance.

A CHRP box, such as the one being demonstrated at Comdex, is expected to boost broader interest in PowerPC platforms. The alliance hopes the CHRP standard will give application developers, peripherals manufacturers and card makers a broad-based and common platform for which to develop their wares.

The CHRP standard would also give users in mixed hardware and operating system environments a common platform on which to run their applications.

"Potentially it is the first step, the forerunner of a standard, volume desktop," said Joseph Ferlazzo, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "But to succeed, [the members of the alliance] still have to show where the value-add comes from" in order to wean users away from standard Intel Corp.-based architectures.

CHRP-complaint boxes won't be that different from standard PowerPC desktops apart from user-transparent changes such as the memory map and interrupt architecture, a source close to the alliance said.

A standard CHRP desktop, for instance, will be based on PowerPC 604 or 601 chips and will feature at least 16M bytes of RAM, 1G byte of hard disk space, Peripheral Component Interconnect technology, enhanced graphics and multimedia capabilities.

Getting CHRP systems out in volume will be vital to the alliance, according to analysts. Despite its broad objectives, the PowerPC effort has coalesced almost entirely around Apple.

As the largest vendor of PowerPC based systems, the Cupertino, Calif.,

PowerPC, *page 12*

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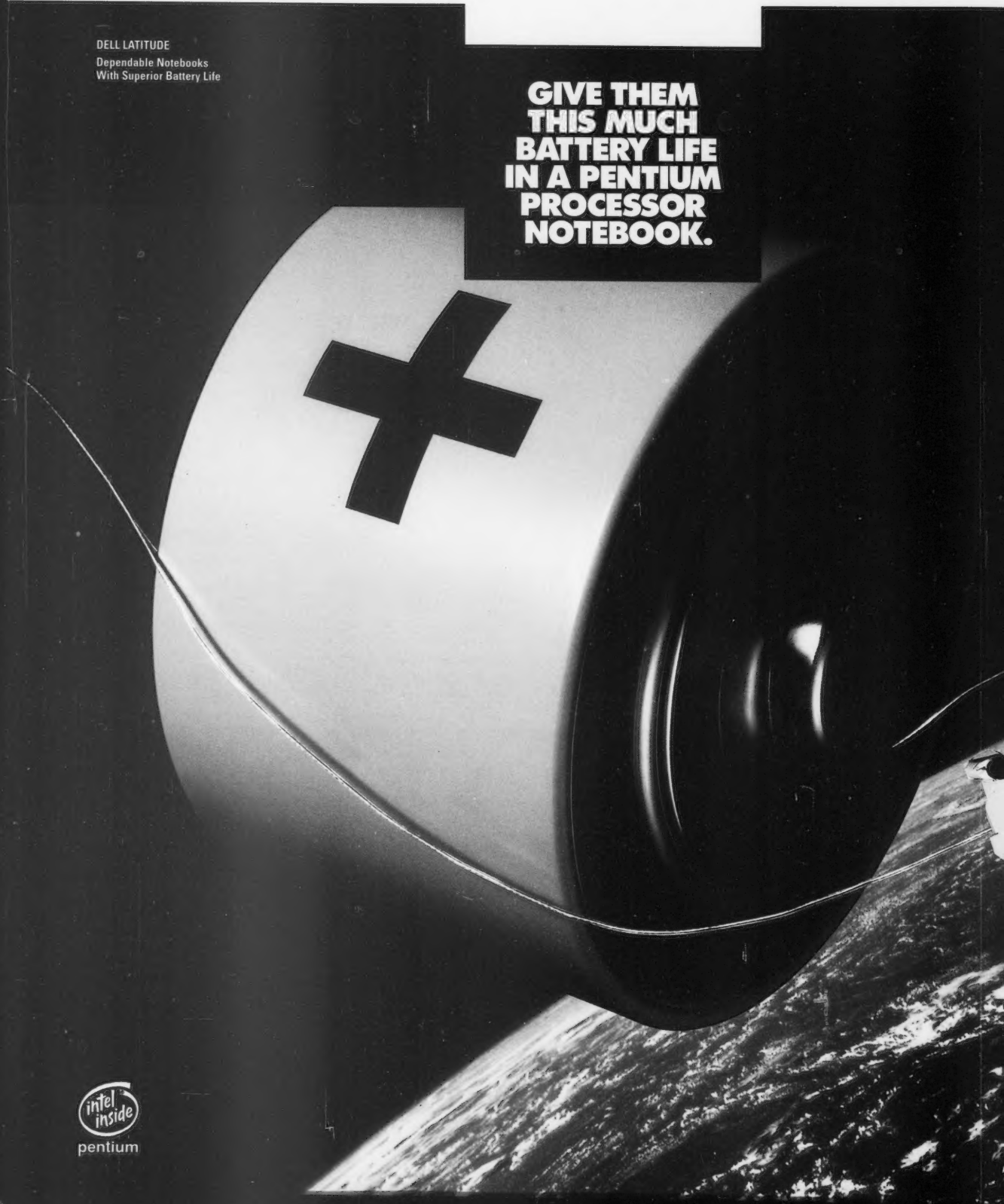

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Inside Computerworld

Nov. 13, 1995

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Hype about the "Internet appliance" has reached new heights. But Microsoft technostrategist Nathan Myhrvold says the small-minded notion is doomed to fail.
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Choice Cuts

Out of 250 companies surveyed, more than 95% plan to create a data warehouse. Warehouse pioneers reveal the pros and cons of this commodity. **In Depth, page 129**

Sandra Bazarian, Robert Typanski and John Rome give their opinions

Jeffrey Papows

Michael Zisman

In an interview with Michael Zisman and Jeffrey Papows, the new leaders at Lotus look at the company's future. Among other things, Lotus plans to stay the course with its applications business.
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COMING NEXT WEEK:

Web payoffs NOW

Our new Electronic Commerce quarterly report looks at how smart companies such as Fidelity Investments and FedEx are using the World Wide Web for customer service and market research

Etc.

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Platinum dumps Unix

By Julia King

About 175 companies will be left in the lurch by Platinum Software Corp.'s decision to pull the plug on its Unix-based client/server financial applications.

The $50 million, Irvine, Calif.-based vendor last week said it will hitch its fortunes to Microsoft Corp.'s Windows NT operating system. Platinum will turn to an all NT-based, client/server product line aimed at companies with annual sales of less than $500 million.

Company officials said they still will support their base of Unix/Sybase users with upgrades through next year and telephone technical support and bug fixes through 1997. "We're basically giving people 24 months to evaluate what they want to do," said Kevin Dowling, the company's vice president of marketing.

He said Platinum expects 75% of its users to migrate to the SQL NT environment. Analysts called that a realistic estimate.

Platinum this week will announce a new version of its SQL NT accounting software, formerly known as SQL Enterprise. Until a month ago, SQL Enterprise also was available in a high-end Unix version that ran on Sybase, Inc.'s database.

But after it reported last month a first-quarter loss of $4.5 million for fiscal year 1996, Platinum decided to drop the Unix version and focus on developing and marketing its software as "a killer application for Microsoft's BackOffice," Dowling said.

Analysts generally applauded Platinum's focus on NT, which "kind of gives them a midlife kicker," said Barry Wilderman, vice president of the application strategies service at Meta Group, Inc. in Stamford, Conn. "This was a company that had been awful at sticking to their knitting, and they were bleeding at the high end," he said.

But users such as Rob Sellers, vice president and controller at United Video Satellite Group, Inc. in Tulsa, Okla., aren't sure what the future holds.

"I didn't see this coming. Not at all," Sellers said. "We don't know what we're going to do. The choice is either migrate to SQL NT or go with another application."

Either way, Sellers said United Video most likely will need to retool several other applications, including an executive information application that it wrote specifically to work with Platinum software.

Other users were concerned that Microsoft's BackOffice, which comprises the NT operating system and SQL Server 6 database, will be less robust than the Unix/Sybase combination. Hardware replacement is another issue that some must consider.

"A lot of Platinum Unix customers are on Sun Microsystems, Inc. platforms," said Mark Lefneski, a Toronto-based independent consultant who specializes in Platinum implementations. The problem is that NT doesn't run on Sun equipment, he said. But Lefneski noted that users could save money in the long run because of the pricing differential between NT and Unix hardware platforms.

Rough road

Last year wasn't a good one for Platinum executives. Company founder Gerald Blackie resigned, and the company incorrectly recorded revenue of $18 million, souring Wall Street and potential customers.

Microsoft pushes SQL Server toward the enterprise. See page 55.

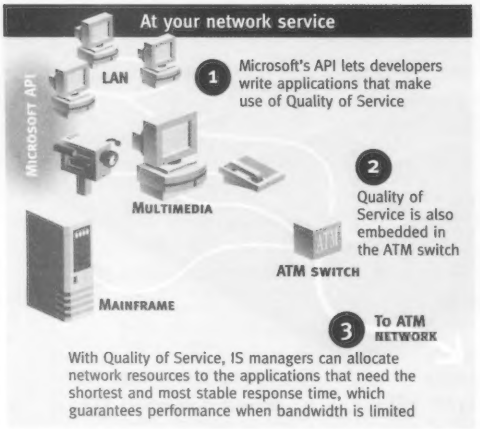
Microsoft API paves ATM's way

By Bob Wallace

In what industry experts predict will be a watershed event in the evolution of Asynchronous Transfer Mode (ATM), Microsoft Corp. soon will announce an application programming interface (API) that will let applications harness the high-speed switching technology.

The desktop titan and Intel Corp. will release a beta version of the Winsock 2 API software development kit in the next few weeks and will host a series of events to fix any problems in the applications. The final specification will be completed by the middle of next year.

"This is one of the most important developments in the history of ATM and a very necessary condition for the success of the technology," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "[The API] lets programmers easily adapt existing applications to ATM with minimal reprogramming and ensures that new applications will be ATM-aware."



With Quality of Service, IS managers can allocate network resources to the applications that need the shortest and most stable response time, which guarantees performance when bandwidth is limited

Concurring opinions

Other analysts agreed. "The ATM infrastructure, in terms of switching systems and related products, has been [on] the market for some time now," said Daniel Briere, president of TeleChoice, Inc. in Verona, N.J. "It's the applications that users have been waiting on — applications that use the power of ATM."

Tim Kwok, chief ATM architect at Microsoft, said Winsock 2 "provides a single API for the development of applications for all our Windows platforms."

Analysts said users can expect to see by spring applications created using the Winsock 2 API. Other applications will roll out later next year and in 1997.

Chief among ATM's capabilities is Quality of Service. This function lets information systems managers allocate network resources to applications that need the shortest and most stable response times.

"Under traffic load changes, there can be huge differences in response times, but [there are] some applications, such as customer service and telemarketing, where companies can't tolerate variations in response times," Nolle explained. Quality of Service "changes that by letting you set performance parameters," he said.

For example, an IS manager who runs multiple applications over an ATM network can assign relative priority to each application. This guarantees performance if bandwidth is constrained or service quality slips, Kwok noted.

Users could, for example, give applications that require audio and/or video a higher priority than data applications since the former can't tolerate delay.

Critical feature

Users say the benefits of ATM Quality of Service are mandatory for those implementing ATM. "Why would anyone want to run applications over ATM networks if they couldn't set parameters on how they wanted the applications to run?" asked Bill Horst. He is chief of the General Services Administration's Philadelphia communications branch.

Winsock 2 also takes into account address resolution. Kwok said the API handles this task for IP, Novell, Inc.'s IPX and the industry standard Open Systems Interconnection.

Kwok said the beta Winsock 2 API development kits will carry a minimal charge.

Microsoft didn't handle the Winsock 2 API alone. It received help from the ATM Forum, which soon will approve a specification that defines "semantics." Built in to APIs, semantics are the basic capabilities that specify a means for setting up and tearing down calls over an ATM network.

DOJ zeroes in on IBM Credit Corp.

By Mitch Betts
WASHINGTON

The U.S. Department of Justice is investigating IBM Credit Corp.'s secretive "total solution lease" program for possible violations of the 1956 Consent Decree, which prohibits anticompetitive tactics by IBM.

The move comes as IBM is urging a federal court to terminate the consent decree. The Justice Department tentatively agreed to relax some provisions, but it is seeking public comment and checking to see if IBM has been complying with the decree.

Bob Braun, a spokesman for IBM Credit in Stamford, Conn., confirmed that the government requested information about its mainframe leasing program. It offers high-end customers a single price for a bundle of hardware, software, maintenance and services.

Braun said IBM is absolutely confident the leasing program complies with the tenets of the decree.

On the edge

But IBM's leasing competitors said the bundling makes it impossible to determine the price of individual parts of the bundle. So rivals don't know what prices they are competing against and can't figure out whether IBM gives its leasing arm discounted hardware prices. Such a discount is forbidden by the consent decree.

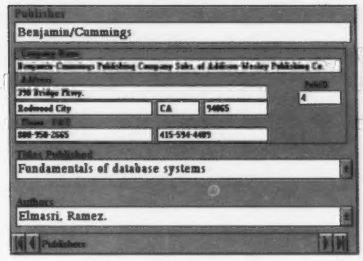
"We don't know if there's a violation of the decree, but it's uncanny that our members can't beat IBM on these deals," said David Poisson, president of the Computer Dealers and Lessors Association in Washington.

But former IBM executive Sam Albert, now a consultant in Scarsdale, N.Y., defended IBM. "No one else has to disclose their prices, so why should IBM have to tip off competitors about how they do it?" he asked.

"The short-term view is that users are getting good deals [from IBM]. The long-term view is that, if the rest of the leasing industry is driven out of business, users will eventually be stuck with IBM," said Robert Callery, an analyst at International Data Corp. in Framingham, Mass.

Database Developer Productivity Comparison

Visual Basic



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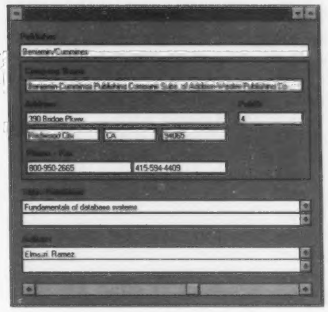
```
Sub PubPubID_Change ()
Dim SavePlace As Variant
Dim SQL As String
If Loading Then Exit Sub
PubsTitles.Clear
PubsAuthors.Clear
SQL = "Select distinct Title from Titles"
SQL = SQL + " where titles.PubID = " &
        PubPubID.Text
DataCtl(PubsList).RecordSource = SQL
DataCtl(PubsList).Refresh
Do While Not DataCtl(PubsList).Recordset.EOF
  PubsTitles.AddItem
        DataCtl(PubsList).Recordset(0)
  DataCtl(PubsList).Recordset.MoveNext
Loop
If PubsTitles.ListCount > 0 Then
        PubsTitles.ListIndex = 0
SQL = "Select distinct Author from Titles,
        Authors"
SQL = SQL & " where Titles.AU_ID =
        Authors.AU_ID and "
SQL = SQL & " titles.PubID = " & PubPubID.Text
DataCtl(PubsList).RecordSource = SQL
DataCtl(PubsList).Refresh
Do While Not DataCtl(PubsList).Recordset.EOF
  PubsAuthors.AddItem
        DataCtl(PubsList).Recordset(0)
  DataCtl(PubsList).Recordset.MoveNext
Loop
If PubsAuthors.ListCount > 0 Then
        PubsAuthors.ListIndex = 0
End Sub
```

Oracle Power Objects



3 DRAG AND DROPS

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InfoWorld (8/7/95) confirms: "Unlike Microsoft's Visual Basic (VB), Power Objects is truly object-oriented. And Power Objects boasts cross-platform support that VB can't match." In fact, it lets you run Windows applications unmodified on the Macintosh. Experience the productivity benefits of a state-of-the-market, object-oriented client/server tool. For a limited time, upgrade from your current general-purpose development tool to Oracle Power Objects for just $99. Offer expires 12/15/95.

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MVS to distribute objects

By Craig Stedman
NEW ORLEANS

Trying to bring mainframes into the mainstream of object-oriented technology, IBM next month will make it possible for big-iron boxes to trade pieces of applications in object form with Unix and PC servers.

IBM told attendees at last week's Guide International Corp. user group meeting that Release 2 of its SOMobjects for MVS software will start limited shipments in December and become widely available next year. The release adds support for IBM's Distributed System Object Model (DSOM), which lets users move application components among servers.

DSOM and the nondistributed SOM are IBM's versions of the Common Object Request Broker Architecture (CORBA), which the Object Management Group created as a standard way of exchanging objects. DSOM should allow mainframes to shake hands objectwise with any system that supports the emerging CORBA 2 specification on multivendor interoperability, IBM said.

Mainframes

With DSOM, SOMobjects for MVS applications running on a mainframe will be able to access external objects without knowing their location, said Jess Rowland, a planner at IBM's System/390 division in Poughkeepsie, N.Y. An interface repository keeps track of distributed objects for the systems.

Mainframe users at the Guide conference said DSOM and other object technologies that are becoming available on System/390s could streamline development and make it easier to marry legacy and client/server applications. But their companies are approaching objects with caution, the users added.

New Brunswick Telephone Co. in St. John is developing kiosk and voice-recognition applications that let customers pay bills and add services. But it doesn't want to offload data from the safe haven of the mainframe, said A. W. Keetch, a technical staff member.

SOMobjects "will maybe give us a better infrastructure to work with," Keetch said. "With DSOM, we could leave the data where it is and let other systems get at it without having to totally reinvent the wheel."

Humana, Inc. is intrigued by objects' potential to make mainframe applications easier to maintain, said Mark Smalley, an analyst at the health care organization in Louisville, Ky. "But it's going to take time. This is a big learning curve for us."

To do list

IBM's update on delivery of its object-oriented products for mainframes

	Product	Availability
✔	C/C++ for MVS/ESA	March 1995
	SOMobjects for MVS	
✔	• Runtime services	June 1995
✔	• Development environment	June 1995
✔	• Application class libraries	September 1995
✔	IBM Cobol for MVS and VM	October 1995
	SOMobjects for MVS Release 2	December 1995*
	Smalltalk for MVS	To be announced
	Object-oriented Rexx	To be announced
	PC-based compiler/debugger	To be announced

*Limited availability

Transaction monitors move to support objects. See page 79.

VMS users gaining 64-bit advantage

By Michael Goldberg

Digital Equipment Corp. next month will release Version 7.0 of its proprietary OpenVMS operating system, fulfilling a pledge to bring its longtime users a 64-bit migration path before the year is out.

Operating systems

Digital officials said they plan to showcase Alpha servers running Version 7.0 at the Digital Equipment Computer Users Society conference (DECUS) on Dec. 4 in San Francisco. At least one database vendor will be there to demonstrate applications running on the OpenVMS platform, the officials said.

Maynard, Mass.-based Digital has offered Unix for 64-bit Alpha microprocessors for two years, but the estimated 10 million VMS users haven't enjoyed even the chance of parity until now.

Digital officials said all applications written for 32-bit versions of OpenVMS will work on Alpha servers and workstations running the 64-bit edition. "If nothing else, this should put to rest the rumors that Digital is no longer investing in OpenVMS. Despite the rising tide of Windows NT, it's clear that OpenVMS isn't dead yet," said analyst Terry Shannon, editor of "Shannon Knows DEC," a newsletter in Ashland, Mass.

Plus for databases, too

Users said the 64-bit addressing in Version 7.0 will allow enterprises with large databases to keep data warehouses within memory, thus speeding up the processing of queries.

"The possibility of running a 64-bit Oracle [database] on Alpha is attractive," said Ed James, manager of computer and communications services at Lockheed Martin Laboratories in Baltimore. A midrange Alpha server user, James said he wants to see what kind of disk storage the new VMS version requires before upgrading.

Oracle Corp. has 64-bit versions of its Oracle7 and Rdb database products for Alpha systems running on Digital Unix. At DECUS, Oracle is expected to announce Rdb Version 7.0 to support very large memory addressing in 64-bit Open VMS, a spokesman said.

Users also said the new file system in Version 7.0, called Spiralog, will cut disk-induced delays because Spiralog allows applications to continue running while the system is being backed up.

Systems consultant Robert Gezelter in Flushing, N.Y., a longtime VMS customer, said using Spiralog is like upgrading from Johannes Gutenberg's printing press to image-based publishing. "It reduces the head movement on the disk. The performance improvement ripples through everything running on the machine," Gezelter said.

Holiday rollout

Digital will unveil Version 7.0 of its OpenVMS operating system Dec. 4. Notable features include the following:

64-BIT ADDRESSING: Allows a database with up to 8T bytes of data fit in one address space.

SPIRALOG: Lets applications run while the system is being backed up. It's a log-structured file system.

KERNEL THREADS: Distribute processing in one program over multiple processors.

Digital brings reliable WAN routing to NT

By Michael Goldberg

Digital Equipment Corp. is bringing a much-desired reliability to Microsoft Corp.'s Windows NT with fault-tolerant software that will eventually span multiple platforms.

Digital will show a Windows NT version of its Reliability Transaction Router (RTR) middleware for wide-area networks at the upcoming Digital Equipment Computer Users Society conference on Dec. 4, *Computerworld* has learned.

When installed in a PC or server in a WAN, RTR acts as a virtual network router, sending transactions from one location to another in a way that is transparent to the end user.

With Version 3.1 of RTR, Digital is opening a software product some observers call "a well-kept secret" in enterprise messaging technology. So far, RTR has run on Digital's Unix and OpenVMS platforms and SunSoft, Inc.'s Solaris Unix. There are approximately 5,200 organizations using RTR middleware, most with hundreds of end users, according to Digital.

Future versions of RTR will run on other vendors' versions of Unix, according to Digital marketing manager Bob Slone.

Users of RTR said making RTR suitable for an open systems environment is critical to its future value.

At OM Group Systems International in Stockholm, systems developers mix RTR as the fault-tolerant ingredient in a networking package designed for stock exchanges and securities trading houses. The Milan, Italy, stock exchange and the American Stock Exchange in New York use it.

Mats Andersson, senior vice president of information technology strategy at OM Group, said RTR for Windows NT will give his firm more flexibility. "That's very important to us because we focus on a lot of the client applications," he said.

Digital's Reliable Transaction Router software

WHAT IT DOES: Routes messages between distributed clients and servers

OPERATING SYSTEMS SUPPORTED: Microsoft's Windows NT*, Digital's Unix and OpenVMS, Sun's Solaris.

PRICE: $338 per front-end license, approximately $9,000 for a server license

*Available December 1995

Along with Isis software from Stratus Computer, Inc. and NQ Series software from IBM, Digital's RTR middleware is one of several enterprise messaging products available, said Jim Johnson, chairman of The Standish Group International, Inc. in Dennis, Mass.

With its ability to detect network system faults and reroute transactions, RTR is valuable for users who want to do business over the Internet, he said.

"[In] electronic commerce, we don't always know who our partners are [or] how reliable their systems are," Johnson said. "We need a way to make sure the stuff we do is reliable and hope there's reliability at the other end."

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Power pricing

CA cuts Unicenter prices to lure users

By Thomas Hoffman

Computer Associates International, Inc. last week slashed prices on its CA-Unicenter systems management software by up to 40%. The move was an unabashed effort to snare in the CA net the remainder of the low-end Unix and Microsoft Corp. Windows NT market.

Also last week, CA reduced the price for some of its mainframe packages by up to 5% and increased the price of others by up to 8%.

CA's latest Unicenter pricing scheme — the vendor's second such discount in 15 months — drops server software costs from $700 to $400 per power unit [CW, Oct. 9]. CA uses what it calls "power unit" pricing for software that runs on Intel Corp. processors. As such, Unicenter will be priced at 18 power units for each Intel processor used to run the software.

Price cuts

"This is effectively a push to lock up" the low-end distributed systems management market, said Sanjay Kumar, president and chief operating officer at the Islandia, N.Y., software giant.

Au Bon Pain's *Mark Factor says the firm will stay with Cabletron despite CA's price cuts*

Last year, CA was the market share leader in the $1.24 billion worldwide Unix systems management market with an 18.7% share, according to Paul Mason, an analyst at International Data Corp. in Framingham, Mass.

Analysts praised CA's Unicenter fire sale as well as the vendor's plans to integrate the recently acquired Legent Corp. smart agent technology into its systems management suite. Legent AgentWorks software, which CA plans to ship to Unicenter customers by year's end, "will give CA a leap over the competition by providing this free to customers," said Brandon Musler, an analyst at Illuminata, a consultancy in Nashua, N.H.

The smart agent technology will be used to help users identify and isolate network problems.

Musler said CA's previous Unicenter discounts in August 1994 went a long way toward helping the software giant land a substantial — though unquantifiable — number of entry-level customers.

Before CA slashed its Unicenter prices in August 1994, it was posting about $55 million in quarterly Unicenter sales. After the price cuts, CA's quarterly Unicenter sales swelled to $80 million to $90 million per quarter, analysts said.

Musler said he expects the same kind of success this time. But the pricing moves may not be enough to persuade some customers to do an about-face. "At this point, we're really looking" at Cabletron Systems, Inc.'s Spectrum network management product, said Mark Factor, vice president of information systems at Au Bon Pain Co. in Boston. Factor said his company's decision to go with Spectrum was due, in part, to its use of Cabletron MMAC3 hubs.

CA will also expand Unicenter maintenance to include functional product upgrades for an optional charge of 19% of Unicenter license fees. Previously, CA-Unicenter maintenance included only telephone support and bug fixes. Analysts said the same support from competitive vendors, including product upgrades, typically costs 10% to 12% of base software fees.

CA will also begin offering Unicenter customers full-time, on-site "enterprise management specialists" to ensure effective implementation of the software.

Unicenter customers who want on-site support from one CA consultant would pay $196,000 annually, according to Kumar.

This figure compares well to the going rate. In fact, some consultancies charge more than $500,000 a year to farm out a single hired gun to lead a customer's systems or network management endeavor, according to Julie Hahnke, director of corporate services at Hurwitz Consulting Group, Inc. in Newton, Mass.

CA will integrate applications with Unicenter. See page 82.

News Shorts

Microsoft outsources PC support

Microsoft Corp. decided last week to let someone else look after its PCs, network systems and 16,000 users. **Entex Information Services** in Rye Brook, N.Y., has signed a three-year, approximately $40 million contract to manage all hardware, software and network systems at Microsoft's Redmond, Wash., headquarters and 25 locations across the country. Some 275 Entex employees will even take help desk calls from Microsoft employees with questions about the Microsoft software they are running.

Borland supports Paradox users

Borland International, Inc. last week assured users who bought Paradox in the Novell, Inc. office suite that they will get full technical support from Borland, no matter which vendor sold them their Paradox PC database. Previously, Novell handled support for Paradox customers who bought the package as part of its PerfectOffice Professional suite. Borland also said it will release early next year a Windows 3.1 version of Paradox 7.

IBM cuts 1,200 employees

After saying last month that more workforce cuts were on the way, **IBM** lived up to its word last week. The company handed out layoff notices to about 1,200 workers. An IBM spokesman wouldn't comment on whether further reductions are planned but said IBM is still hiring in areas such as networking and services. Not counting employees added through its acquisition of Lotus Development Corp., IBM expects to end the year with approximately 220,000 workers — the same number it had in January.

Sun's Ultra machines debut

Sun Microsystems, Inc. in Mountain View, Calif., last week launched its UltraSPARC-based 64-bit Unix workstations. Entry prices for the midrange boxes start at $16,495 — lower than expected [CW, Nov. 6]. The Ultra 1 uniprocessor units ship immediately, while the dual-processor Ultra 2 units are set to ship in mid-1996, Sun said.

Banks consolidate IS

Under a merger proposal unveiled last week between **First Interstate Bancorp** and **First Bank Systems, Inc.**, the banks plan to cut operating expenses by $500 million. A big chunk of the savings will come from consolidating the companies' data processing organizations. The banks last week told analysts that 450 information systems positions would be eliminated for $80 million in savings.

BMC ports management tools

Hoping to provide administrators with a single-console view of all systems, from departments to the data center, **BMC Software, Inc.** will extend its Patrol management tools to monitor MVS mainframes and Novell NetWare servers. Beta testing begins next month for the new Patrol modules, which should ship at the end of next quarter, officials at Houston-based BMC said last week.

3Com unveils Token Ring switch

3Com Corp. plunged into the nascent Token Ring switching market last week with the announcement of an inexpensive and flexible stackable Token Ring switch. Designed for data centers or workgroups, LinkSwitch 2000 TR will ship next spring. The 12-port switch will costs less than $700 per port. It will be followed by a separate system for the desktop, the LinkSwitch 100 TR, late next year.

U.S. computer market growing

The U.S. information technology market grew by 10.3% last year, according to a recent report by International Data Corp. in Framingham, Mass. For the third consecutive year, the U.S. market outpaced the worldwide information technology market, which grew at 7.5%, the report said. Strong increases in PCs, servers and networking gear were countered by slower growth in services and declining sales of multiuser systems.

Groups object to proposals

Industry groups last week soundly rejected the latest White House proposals for the export of cryptographic products. In a letter to Vice President Al Gore, the **Business Software Alliance** called the plan "fatally flawed." In another letter to Gore, an ad hoc coalition of 37 high-tech companies said it would come up with its own proposal within six months. The groups object to the government's requirement that strong encryption products be exportable only if they place encryption keys in escrow for use by the government under court order.

SHORT TAKES By May, mobile Informix users will be able to fax, send electronic mail, transfer files and connect to database servers, thanks to an agreement due to be announced today between **Informix Corp.** in Menlo Park, Calif., and **MobileWare Corp.** in Dallas.... **Microsoft** last week announced it added support for Infrared Data Association (IRDA) connectivity to the Windows 95 operating system. IRDA is a wireless way to connect to computers and peripherals. ... By mid-1996, **Pilot Executive Software**'s Lightship decision support software will be able to detect trends and make predictions, the Boston-based company said last week.... By mid-1996, Oracle7 users will be able to link low-cost symmetrical multiprocessing Intel Corp. machines for higher availability and improved performance, **Oracle Corp.** said last week.... **Sears, Roebuck & Co.** denied rumors last week that it is looking to dump its 50% stake in **Prodigy Services Co.**, the online service Sears owns with **IBM**. Sears executives said they'll decide by year's end what to do about Prodigy.

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Java percolating with partners

By Frank Hayes and Jean S. Bozman

Hoping to challenge Microsoft Corp.'s control of corporate desktops, Sun Microsystems, Inc. last week said it plans to have a wide range of applications and tools available when it formally launches its Java language system in January.

To bolster that effort, Sun also announced it has added Borland International, Inc. and Spyglass, Inc. to the list of vendors that have licensed Java to build it into their products (see chart).

Unlike conventional software, applications written in the Java language are designed to be downloaded from a network and run on any computer equipped with a Java-enabled World Wide Web browser.

More than 10,000 users and developers have registered interest with Sun since a free test version was released in May. And 400 applications have been written.

"Technically, [Java] is clean, and it's a good idea," said Mark Shirley, a researcher at Xerox Corp.'s Palo Alto Research Center in Palo Alto, Calif.

A program written in Java can be downloaded and run on any computer with a Web browser that supports the language. This means corporate applications created in Java could be centrally stored and managed on servers and downloaded to desktops as needed.

Brewing business

Sun signed up the following firms as Java partners this year

MAY

- Netscape Communications announced it will embed Java in Navigator 2.0 browser

OCTOBER

- Oracle announced it will embed Java in Powerbrowser
- Macromedia announced it will release Java-based development tools

NOVEMBER

- Borland will announce it will build Java-based development tools
- Spyglass will embed Java in its Spyglass Mosaic browser

Some organizations already use this centralized approach with corporate applications. "We store our applications on multiple servers, even things like Microsoft Office," said Kent Podvin, director of information systems strategic planning and re-engineering at Rite Aid Corp., a drugstore chain based in Camp Hill, Pa.

Still, users figure Java may take a while to brew. "I think it will take a year or two until you see it on everybody's desktop," said Mussa Khiar, a network administrator at Raychem Corp., a chemical and materials company in Menlo Park, Calif.

In the meantime, Sun is encouraging the development of programming tools and finished Java applications from third-party vendors. Evidence of that push includes the following:

- Borland in Scotts Valley, Calif., will create Latte, a rapid-development tool set for building Java applications. The tool set will ship by the middle of next year and will resemble Borland's Delphi or Microsoft's Visual Basic language.
- Applix, Inc. in Westboro, Mass., has developed a Java-based spreadsheet, dubbed Espresso, that can import data updates while a user views the spreadsheet on-line.
- National Semiconductor Corp. in Santa Clara, Calif., demonstrated an application that lets customers find information about 30,000 products via the Web.

A hot list of Hot Java resources. See The Internet Page, page 66.

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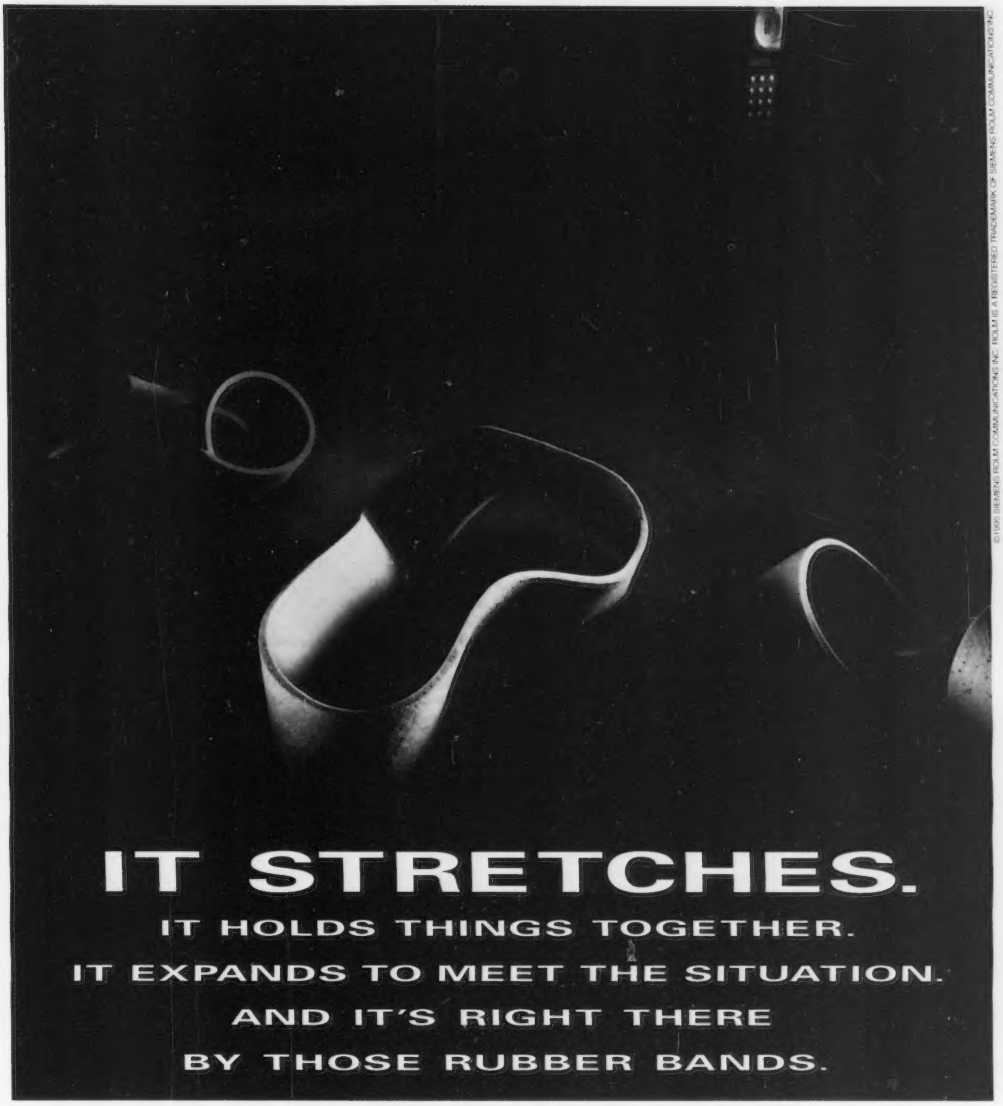

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Switch to Win 95 on track

Early adopters report smooth but lengthy installation process

By Stuart J. Johnston

Although the vast majority of large corporations are still taking a wait-and-see approach to Microsoft Corp.'s Windows 95 or doing pilot installations with small numbers of users, early adopters say everything is going smoothly but has taken longer than expected.

Information systems managers at several such sites who were interviewed last week said that under Windows 95 their systems are dramatically more stable than they were under Windows 3.1.

Stable environment

They also reported that no significant or insurmountable bugs have turned up and that users are requiring much less training than expected.

"It's a lot more stable than the Windows 3.1 clients," said Don Barker, associate professor of information sciences at Gonzaga University in Spokane, Wash. "I did no training other than about 10 minutes to show [my users] the basics."

However, the early adopters all mentioned one speed bump. For entirely different reasons in each case, installation has taken longer than expected.

For instance, Cinergy, Inc., a multistate gas and electric utility based in Cincinnati, has already converted more than 1,700 of the 2,100 users who requested Windows 95, said Gary Walker, manager of information technology services.

Most of the move went smoothly, he said. But installation times were about double the two hours the company had planned for, primarily due to a wide mix of desktop equipment. He also noted that better planning would have helped alleviate user demands on the in-house help desk.

"It's going slower than we wanted [because of the time required in] getting everybody bought off on it and getting [the installations] scheduled at 120 offices," said Gary Tiesenga, manager of network services at accounting giant Deloitte & Touche in Nashville.

So far, Deloitte IS staffers have installed Windows 95 on about 1,500 PCs and plan to have 5,000 up and running by the end of this year. After that, Tiesenga has to wait until after tax season before he can finish installing an additional 11,500 copies planned by the end of next year.

New configuration

Greg Scott, IS manager in the college of business at Oregon State University in Corvallis, Ore., had 320 nodes already installed at the school by Windows 95's launch in August.

But because the college keeps most systems software on network servers and not on users' local hard drives, it took his staff a lot of advance work to figure out how to do that with a system that Microsoft designed to be loaded locally.

However, once installed, "it has been rock-solid," Scott said. "By and large, user response has been very favorable. And I really anticipated that training was going to be a big issue, [so] we scheduled a bunch of classes. But training turned out to be pretty much a nonissue."

Scott has been planning for Windows 95 for two years and that helped because he began buying more powerful PCs — fast 486- and Pentium-based machines with 16M bytes of RAM — last year, he said.

PowerPC boxes

CONTINUED FROM PAGE 1

company estimates it has sold more than 2.8 million Power Macintoshes since the machines were unveiled in March 1994. Apple has accounted for 98% of all PowerPC shipments, said Pieter Hartsook, editor of "The Hartsook Letter" in Alameda, Calif.

IBM's efforts to push its own Power Series PowerPC desktops and notebooks, which were launched in June, have met with very limited success. The machines lack mainstream, commercial operating system support, analysts said. IBM has acknowledged it won't target mass-volume markets with its systems.

IBM's PowerPC systems support several 32-bit operating systems but only the AIX operating system is currently shipping on its platforms.

Other vendors, including Canon Computer Systems, Inc. and Zenith Data Systems, announced PowerPC-based Windows NT server earlier this year. But customer interest so far has been muted, analysts said.

"The basic question still is, 'so what software are you going to run?'" said Tony Massimini, an analyst at Semico Research Corp. in Scottsdale, Ariz.

Apple's clone vendors also have met with limited success. The company's controversial decision to boost market share by licensing its Mac OS to Power Macintosh clone makers has yet to yield PowerPC-based systems in volume.

Radius, Inc.'s cloning efforts have been stalled by nagging financial problems.

DayStar Digital, Inc., the first company to offer a multiprocessing Power Macintosh, caters to a niche market in high-end publishing.

PowerPC history

Date	Announcement
October 1991	IBM, Apple and Motorola form the PowerPC alliance
November 1993	IBM announces Prep specifications
March 1994	Apple ships its first PowerPC-based Power Macintosh
November 1994	CHRP strategy announced by IBM, Apple and Motorola
June 1995	IBM ships PowerPC desktop and PowerPC notebook
November 1995*	IBM and Apple unveil finalized CHRP specs, CHRP prototype hardware and CHRP's new name – The PowerPC Platform

*Expected

Performance issues rain on Pentium Pro's parade

By Jaikumar Vijayan

Several hardware vendors last week demonstrated high-end servers based on Intel Corp.'s recently announced Pentium Pro chip at a special coming-out bash in New York. But published reports of some early performance problems put a damper on the party.

Observers described the problems as fairly typical in the early stages of a processor's life cycle. Such problems are likely to be ironed out before systems ship in volume in the first quarter of next year, they said.

However, reports of performance issues such as these could make users more cautious in adopting the new technology, they conceded. "How soon such issues can be either proven or disproven will determine to a great extent how quick, and how sustained, the penetration of the Pentium Pro is," said James Greene, an analyst at Summit Strategies in Boston.

"It makes me cautious," agreed Glen Jurmann, section manager for office technology at Baxter Healthcare Corp. in Chicago. "It makes me stand back and look at price/performance and reliability issues."

System problems

The reports were sparked primarily by Compaq Computer Corp.'s revelation — on the eve of Intel's Nov. 1 Pentium Pro launch — that in certain networked environments, Pentium Pro-based client PCs can drop off the network. This happens under certain conditions where a Pentium Pro server is configured with a mix of older-generation Industry Standard Architecture cards and newer Peripheral Component Interconnect (PCI) adapter cards. Intel confirmed the problem but said it was a system-level issue, not a glitch in the chip.

Pentium Pro issues

Problem: Pentium Pro desktops can drop network connections to clients in certain configurations.

Status: Users must reconfigure their systems when upgrading to Pentium Pro.

Problem: Pentium Pro desktops and servers do not achieve full Peripheral Component Interconnect bus throughput.

Status: Intel has provided desktop vendors with workarounds to boost throughput. For server configurations, the company will release an enhanced version of the Orion PCI chip set next month.

Source: Industry experts

Observers said the problem is simply a matter of older generation cards not keeping pace with newer generation technology, which isn't the fault of Intel or the card maker. However, it could give buyers pause until the two technologies reach the same plane.

Other published reports claim the Pentium Pro chip set isn't achieving full PCI bus throughput in either server or desktop configurations.

Intel has acknowledged the throughput problems in the past. An improved version of its Orion PCI chip set, expected out in December, should address the issue of servers.

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It's show time

By Computerworld staff

It may appear that the only razzle-dazzle to be found at Comdex/Fall'95 is out on the Las Vegas strip, but despite the lack of industry-shaking announcements, show-goers will find plenty to see and do at computing's largest trade show.

Along with the usual heavyweights dominating the airwaves, an expected crowd of 200,000 can visit a series of pavilions emphasizing specific technologies — communications, Integrated Services Digital Network and multimedia, for example — or attend a myriad of sessions.

Keynoters include a who's who parade of chairmen and CEOs, including IBM's Louis V. Gerstner speaking on Monday (his topic is unannounced); Microsoft Corp. Chairman Bill Gates talking about his latest favorite subject — how the Internet will change the way companies do business and how Microsoft applications may change to enable that — Tuesday; and Novell, Inc.'s Robert Frankenberg, whose speech topic also remains under wraps, on Wednesday.

If you don't mind a little fire in the belly and can dig deep into your pockets to help a worthy cause, there is Micrografx, Inc.'s annual Chili for Children cookoff, which kicks off at 6 p.m. Tuesday at the Thomas Mack Arena at the University of Las Vegas campus. The Temptations will entertain amid a backdrop of armadillo races and booth after booth of chili served up by industry bigwigs and wags. Participating vendors will sell tickets at their booths.

Attendees looking for a little historical perspective might want to check out an exhibit called "Generations." It will be on display in Room LN108 on the second floor of South Hall at the Las Vegas Convention Center. Along with the Boston Computer Museum, Data General Corp. and Intel Corp. are sponsoring the exhibit, which highlights major technology shifts in the industry.

As for those who came to prowl the aisles and play with the latest technology, lace up those sneakers, pack your briefcases with extra bags and get ready to hit the floor.

DESKTOP SYSTEMS

In what is widely expected to be another show dedicated to the dominance of the twin-headed elephant — Intel and Microsoft — almost all PC vendors, along with a surprising number of midrange suppliers, will turn out with an array of products built around technology from those companies.

Compaq Computer Corp., IBM, Hewlett-Packard Co., Digital Equipment Corp., Unisys Corp. and **DG** are expected to showcase early versions of workstations and servers based predominantly on Microsoft Windows NT. These will include prototypes of symmetrical multiprocessing servers based on Intel's Standard High Volume server reference designs. The Intel Pentium Pro, formerly known as the P6, is also expected to make its early presence felt on high-end Windows NT desktops from a variety of box makers.

But the spotlight will remain on Pentium-based systems running Windows 95, with particular emphasis on a variety of high-end 133-MHz-based systems equipped with enhanced graphical and multimedia capabilities. Vendors to watch include HP, IBM, Dell Computer Corp. and NEC Technologies, Inc.

The PowerPC triad — **Apple Computer, Inc., IBM** and **Motorola, Inc.** — will demonstrate the first working prototype of a system based on the Common Hardware Reference Platform (CHRP). CHRP allows multiple operating systems to run on a single common hardware platform (see story, page 1). Attendees can also check out the PowerPC pavilion, a huge tent at the entrance of the convention center with PowerPC hardware systems and applications.

SYSTEM SOFTWARE

The irony of the show may be Microsoft's decision to be relatively low key, having little of its own to announce so soon after the summer delivery of Windows 95 and Office 95.

Microsoft will announce a CD-ROM, called InfoSource, aimed at corporate customers. It comprises a searchable listing of vertical market and enterprise system providers and BackOffice tool vendors. And its booth naturally will showcase third-party Windows 95 and Windows NT applications.

IBM, meanwhile, is supposed to unveil the long-overdue RISC version of OS/2, the first IBM operating system to be built on top of the IBM Microkernel. OS/2 for the PowerPC, which was due out last June, is now slated to ship in the first quarter of next year.

Chris Sawicki

APPLICATION DEVELOPMENT

Borland International, Inc. in Scotts Valley, Calif., will ship Borland C++ 5.0, a C and C++ compiler that supports 16- and 32-bit development. The company will also announce additional features of the forthcoming 32-bit version of its Delphi application development system.

Apple and **IBM** will team up with **Component Integration Laboratories** to sponsor an OpenDoc pavilion at the show. Attendees can check out beta versions of OpenDoc products from a variety of third-party developers.

Oracle Corp. plans to announce Windows 95 and Macintosh versions of its Developer 2000 application development system. The Power Macintosh version will ship by the end of the year; the logo-certified Windows 95 version will ship by the end of January.

DESKTOP APPLICATIONS

The vast majority of PC software vendors at Comdex will use the show to introduce enhanced Windows 95 versions of their products (see story, page 1).

For example, **Zenographics, Inc.** in Irvine, Calif., will show a Windows 95 printing utility that improves on the limited 16-bit Windows 95 print engine. SuperPrint 4.0 eliminates the bottlenecks that occur when documents are processed through Windows 95, thereby accelerating the printing process.

Viruses will surely sneak onto PCs along with spiffy new Windows 95 applications, so **Cheyenne Software, Inc.** in Roslyn Heights, N.Y., will introduce a 32-bit version of InocuLAN. The virus-scanning engine runs in the background on Win 95 stations and works with versions on Novell NetWare and Windows NT servers to help manage the spread of rogue code throughout networks.

A number of vendors will introduce Windows 95 graphics, computer-aided design or imaging software. For example, **Adobe Systems, Inc.** will unveil PageMaker 6.0 for Windows 95; it has 50 new features, including support for the Kodak Precision Color Management System, Photo CD support, page layout enhancements and new on-line publishing capabilities.

INTERNET/ELECTRONIC COMMERCE

Expect lots of talk about electronic commerce this year, with several companies vying for attention in that realm. Microsoft will demonstrate early work done with **Visa International, Inc.** to build secure transaction technology. San Rafael, Calif.-based **SBT Internet Systems** plans to announce WebTrader, a tool set for building on-line commerce applications.

For Internet beginners, **Galacticomm, Inc.** in Fort Lauderdale, Fla., will offer a $2,000 starter suite dubbed Worldgroup Internet Server. It includes connectivity software and a gateway to link internal LANs and individual modems to the World Wide Web.

Everyone is hot to establish a presence on the Internet and World Wide Web, but a nifty service can't thrive if the server isn't alive. **Caravelle Networks Corp.** in Ottawa will launch WebWatcher, a tool that discovers and continuously monitors many types of servers connected to TCP/IP networks.

Quarterdeck Corp. in Marina Del Rey, Calif., is expected to launch WebTalk, which was designed to let users talk, telephone-style, over the 'net. A beta-test version of WebTalk, which will expire Dec. 4, will be available to download at http://www.quarterdeck.com.

COMMUNICATIONS

IBM will demonstrate the latest beta version of OS/2 Warp Server and will unveil several enhancements, including broader TCP/IP support. The product melds the best features of LAN Server 4.0 with OS/2 Warp, according to Art Olbert, vice president of LAN systems in IBM's Personal Software Products Division. It is an integrated file, print, application and database server that competes with Microsoft's Windows NT Server 3.51.

Naughty Novell users don't always log off the network when they leave their stations, so open files can scuttle scheduled backups. But improperly closing files can trash the negligent user's data. The NetOff tool from **Citadel Computer Systems, Inc.** in Houston now does more than just close files; it saves unsaved work by calling on a library of keystrokes that exits popular DOS and Windows applications.

MOBILE COMPUTING

Road warriors will find little in the way of mobile product announcements or remote access news. Among the big names showcasing products is **Motorola**, which will unwrap AirPower, wireless messaging software designed for one- and two-way paging. It will give mobile users wireless access to electronic mail and file updates using Motorola's paging technology. A Windows NT version of its Air Apparent paging software is planned.

Sharp Electronics Corp. in Mahwah, N.J., will demonstrate a line of multimedia notebooks, the PC-3020 and PC-3060, both based on **Cyrix Corp.**'s 100-MHz 5x86 processor.

The notebooks will have 10.4-in. screens, slots for one Type I and one Type II PC Card, a 500M-byte hard drive and infrared capabilities. They will cost between $2,299 and $2,599. Sharp will also show the PC-9000 series, high-end notebooks based on high-end Intel Pentium chips, sources said.

Panasonic Personal Computer Co. in Secaucus, N.J., will feature its new V41 MK III notebook with a 120-MHz Pentium processor and a 12.1-in. screen, available Dec. 1. Also available in December and on display will be Hewlett-Packard's OmniBook 5000 notebook with Intel's mobile Pentium chips and docking stations.

IMAGING

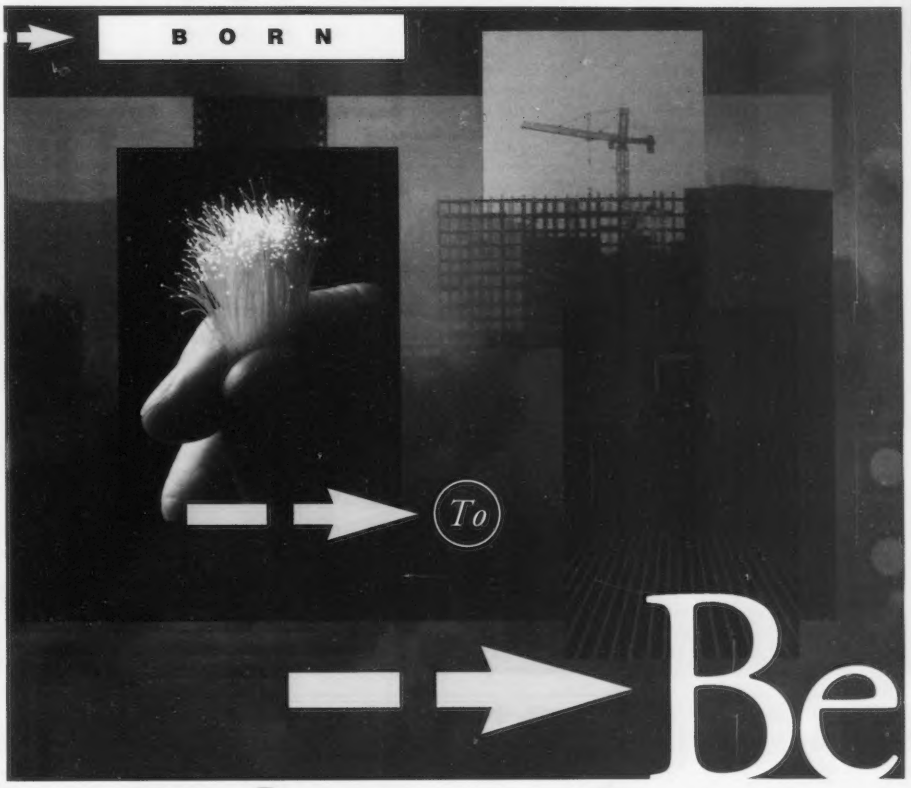
On the imaging side, **Xerox Corp.** will unveil the first products in its Document Centre strategy. The System 20 and System 35 multifunction devices work with Xerox's CenterWare software to let users copy, fax and print right from their PCs.

Panasonic Communications & Systems Co. will unwrap the KX-PS600, a personal image editing system that features printing, scanning, copying and software for text editing and filing of scanned documents.

To move these image files around via fax, **InfoImage Technologies, Inc.** in Palo Alto, Calif., is releasing a 32-bit version of its 3D FAX for Windows 95.

Sony Corp. plans to cram every multimedia technology it can into its announcements this week. Under the theme of the convergence of audio, video, computers and communications, the electronics giant will show new digital wireless devices and machines that display three-dimensional video, for example.

■ Can't — or won't — go to Comdex? Don't fret. Several companies have banded together to provide 120 hours of video from the show over the Internet this week. Monitor the glitz and sizzle at **http://www.comdextv.com.**



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A princely sum?

Companies pay big bucks for a chance to show off wares at Comdex

By Stewart Deck

"No money in your purse? Your eyes are heavy ... your purse ... light; yet you see how this world goes."

—King Lear, Act IV, Scene VI.

Weary eyes, empty purse and experience gained. King Lear could have been describing the aftereffects of being an exhibitor at Comdex/Fall '95. Especially the empty purse.

You wander the heath of the Comdex show floor, past enormous draped booths. You watch presentations enthusiastically delivered by professional presenters, dodge armies of color-clad booth workers, throw footballs through hoops for prizes, stuff marketing literature into your bag and wonder how much it all costs. As Jerry Lewis, a modern day Lear's fool, would say, "Let's go to the tote board!"

Breaking it down

First is the cost of the space itself, $42.50 per square foot. For a small booth, that's close to $40,000. Novell, Inc. signed on for 11,770 sq. ft. ($500,225), and Microsoft Corp. will split 22,568 sq. ft. ($959,140) between two booths. Digital Equipment Corp.'s booths will cover 23,100 sq. ft. ($981,750). Industry insiders say the total cost for exhibiting at a show in Las Vegas is roughly three times the cost of floor space.

The booth structure is expensive, too. Visio Corp. in Seattle will unveil a new booth that costs "roughly $50,000," said Michelle Cormier, demonstration marketing manager. Other companies declined to provide price tags for their booths.

"Drayage" is charged to move materials into the exhibit halls. For Comdex this runs $43/cubic weight (total weight/100) for crated material. One small exhibitor budgeted roughly $10,000 for drayage, according to its events manager.

Other booth expenses include labor to set up the booth ($45/hour per person), professional presenters ($700 to $1,000/day), crowd gatherers ($300/day), prop and utility rental (roughly $9,000 for a medium-size exhibit) and audio/visual equipment rental (small theater, workstations, loudspeakers: $12,000).

The tally in food and lodging costs ($200/night for hotels, $40/day for food) for workers at Novell's 151 scarlet-shirted booth staff: approximately $181,200. Other items include computer and monitor rentals, airline tickets, product giveaways, brochures, reserved meeting rooms/suites and follow-up marketing.

What's the bottom line? Cormier said Visio's marketing budget for Comdex totals "close to $120,000." Visio has 1,140 sq. ft. of exhibit space and 25 booth workers. With meals, lodging and airfare, Visio's total expense comes in just under $125,000.

For companies with 10 times that number of booth workers and 20 times the space, the total is ... a bit more.

A king's ransom you might say.

Booth: **$50,000**

Crowd gatherers: **$250 to $300 each per day**

Cost to ship booth one way: **$2,500**

Labor to set up/build booth: **$45 per hour**

Drayage (Moving items from moving van to booth space): **$43 per unit if in crates; $49.50 if not in crates**

Total estimated cost to display at Comdex: **$124,600**

*Most of these prices depend on the size of the booth. Most prices presented reflect Visio's 1,140-sq.-ft. booth space. Not all charges apply to each booth.

Professional presenter: **$700 to $1,000 per day**

Electrical rigging: **$5,000**

AV equipment : **$12,000**

Booth signs: **$3,000**

Exhibition space: **$48,450** (30 ft. by 38 ft. at **$42.50 per square foot.**)

After-hours security guard: **$15 per hour**

Rental fees for carpeting, furniture, cleaning, electricity, telephone: **$4,000**

Cliff Simkins

Windows 95 apps arrive

CONTINUED FROM PAGE 1

ers and 12 sites that are growing rapidly, so management is a big issue," said Steve Fuchs, lead systems engineer at Blue Cross/Blue Shield of Oregon in Portland.

Fuchs is looking for tools to remotely manage PC desktops, distribute software automatically and do hardware and software inventory in a multiplatform environment.

"Before management tools on Windows 3.1 had a chance to mature, we got two new operating systems — Windows 95 and Windows NT," Fuchs said. "We're trying to buy time until the maintenance releases of Windows 95 and Windows 95 applications come out. The general feeling is not to rush to Windows 95."

As the client/server movement has picked up steam, PC software has grown up to handle more manufacturing functions. Hence, Saturn Corp. in Spring Hill, Tenn., is looking for software that provides redundancy or backup for its NT servers that now manage more mission-critical functions at the car manufacturing plant.

"I don't go to fall Comdex. I go instead to the spring show in Atlanta. But I'll be looking for [Messaging Application Programming Interface] compliance, OLE containers and Microsoft Exchange," said Bruce Bemisderfer, manager of strategic planning and software development at Saturn.

IBM aims to streamline workgroup management

By Patrick Dryden

IBM this week at Comdex will apply the SystemView formula to the workgroup level as it rolls out the second platform in that series of integrated management tools.

System management

SystemView for OS/2 combines IBM's NetFinity server monitor, remote controls and diagnostics, performance monitors and a software inventory dictionary of 3,000 titles, officials said.

Managers and users within stand-alone LANs or network outposts can use SystemView for OS/2 to care for their OS/2 desktops and servers, Windows desktops and Novell, Inc. NetWare servers.

Users dedicated to OS/2 will appreciate this somewhat limited version of SystemView, but more sites would prefer a Microsoft Corp. Windows NT implementation, said Sylvia Clark, an analyst at Aberdeen Group, Inc. in Boston. The Windows NT version will be released late next year. "You're not going to buy this to administer your Windows workgroups," Clark noted.

SystemView for OS/2 costs $499. "On the surface, the SystemView approach promises lots of integration, but IBM only integrates its products," said John Morency, a principal at The Registry, Inc., a consultancy in Newton, Mass. "There's less functionality when you get down to the OS/2 version."

Analysts noted that the OS/2 version includes scant support by tool vendors, lack of support of enterprisewide software distribution and a different interface from other SystemView implementations.

The SystemView tool set will be bundled with OS/2 Warp Server, which is due early next year.

Users can plan networks in virtual fashion, thanks to new management modules. See page 68.

Well, maybe the boss really didn't get your report. But chances are, it's sitting on his desk under a mountain of memos, letters, and other paperwork. Why? Because you may be using the latest hardware and software tools to create your reports, but you're still distributing reports the way people did a hundred years ago... hard copy, interoffice mail. There's got to be a better way...

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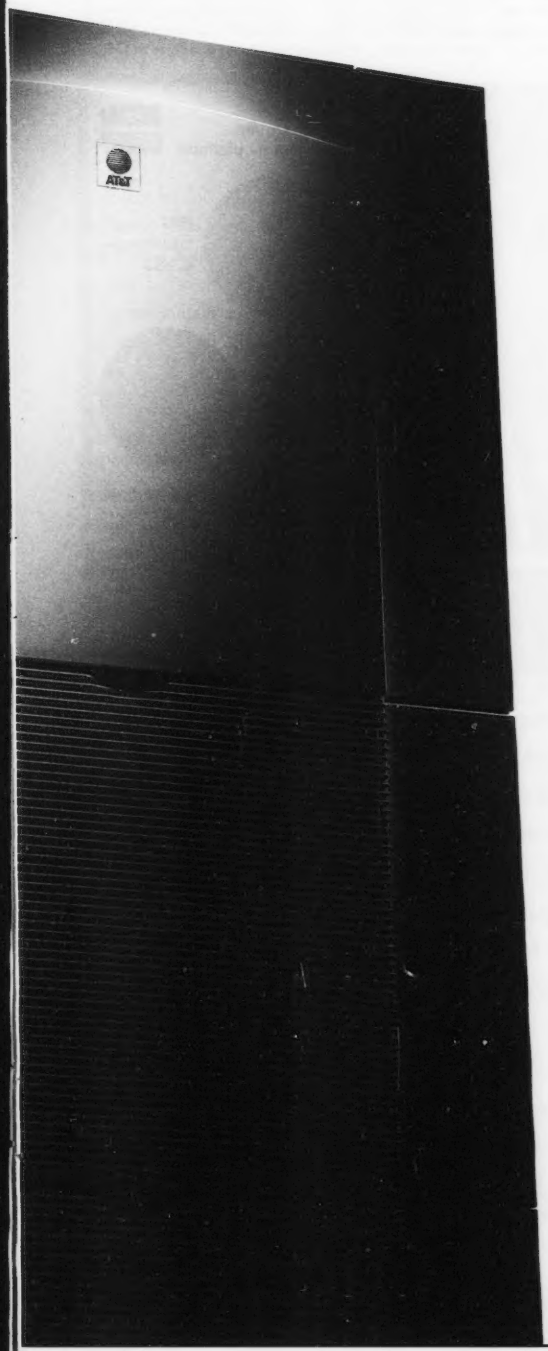

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Client/server midrange expanding

By Julia King

Intentia International, a $110 million Swedish software company, is taking aim at the bountiful midrange market for client/server software with a suite of applications that run on IBM AS/400.

Collectively known as Movex, the suite includes integrated financial, manufacturing, distribution and inventory applications. It is being sold in the U.S. through value-added resellers focused exclusively on the AS/400 market.

Intentia has licensed the software to 1,500 companies, which have implemented it at more than 3,000 sites worldwide.

In the U.S., the company's target customers are manufacturing companies with annual sales of $100 million to $500 million. Other players already in this market include System Software Associates, Inc. in Chicago and J. D. Edwards Co. in Denver. Intentia's North American headquarters is in Rosemont, Ill.

Bruce Richardson, an analyst at Boston-based Advanced Manufacturing Research, Inc., said the Movex suite is rich in function and should tap into "a huge opportunity in the midrange market."

Advanced Manufacturing has estimated that in 1996 about one-third of 100,000 U.S. companies with 100 or more employees will decide to purchase enterprise software.

Source: Advanced Manufacturing Research, Inc., Boston

What sets Movex apart from the competition is its high level of support for multiple languages and currencies, according to Intentia President and Chief Executive Officer Bill Lyon. That kind of support has become a critical factor in an increasingly global business arena.

Knows its languages

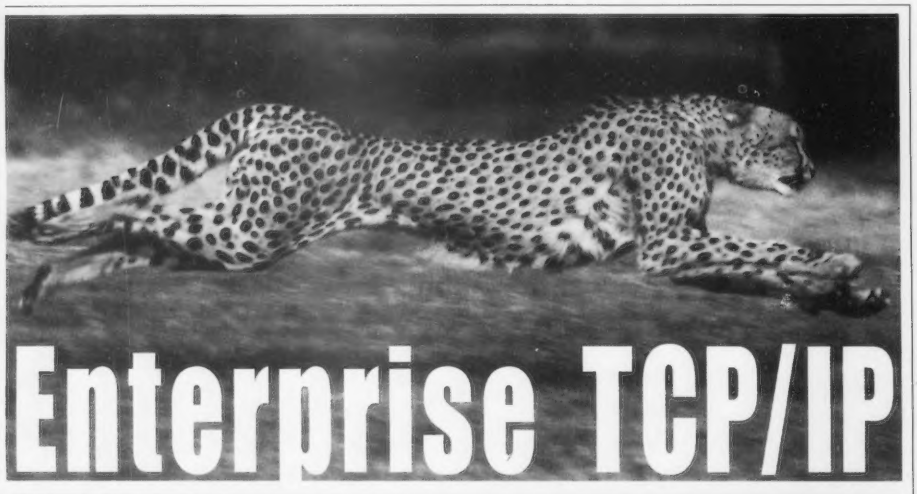
Movex operates simultaneously in 22 different languages and supports both discrete and process manufacturing functions. It also contains an executive performance measurement feature that allows business users to individually configure the data they want to track on a regular basis.

A plant manager, for example, can set the system to track inventory turns without the intervention of the information systems department.

This feature, coupled with the software's sophisticated language support, were key factors in BioMerieux Vitek's purchase of Movex, said Mike Bickel, the company's IS manager.

Based in St. Louis, BioMerieux Vitek is a French-owned manufacturer of hospital laboratory test instruments and diagnostic kits. The company has 18 sites worldwide. In the U.S., it is in the midst of a $3.8 million re-engineering project that involves migrating from a mainframe-based system to the AS/400-based Movex software.

Computer Associates will add Internet support to its manufacturing and business packages. See page 87.



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Purina Mills Satisfies Data-Hungry Decision Makers with the SAS® System

Every business day, information managers at Purina Mills—America's leader in animal nutrition—satisfy a different kind of craving: the need of top executives to get their hands on strategic information to support better quality decisions.

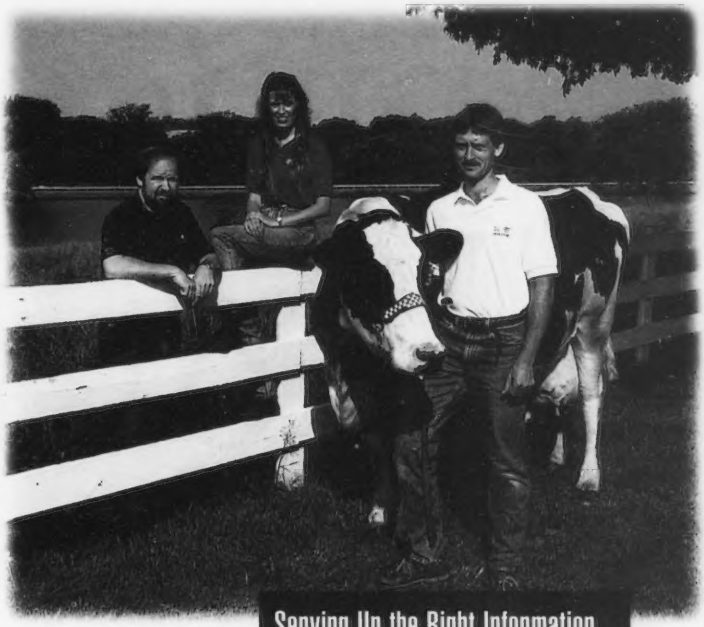
Luckily, they've cut preparation time substantially since adding SAS software to their menu of productivity tools. "Comparing the SAS System to anything else we've ever used to analyze business data, I'd say SAS software is by far the best," says Gerry Daignault, Region Controller. "There was a time when we had to do things manually. But today, we can review many aspects of our business just by pointing and clicking."

Purina Mills relied on the SAS System to build client/server applications now in use by field representatives and managers at specific manufacturing locations. Daignault adds that "SAS software is so simple to use that even those managers and executives who have not previously used computers feel right at home."

Feeding Decisions at Every Level

According to Mike Durbin, Supervisor of Information Services for Purina Mills, his department needs to get information to managers as quickly as possible, who in turn must deliver relevant details to upper management as quickly as possible.

"We use SAS software in many areas of operation including budgeting, research, and as a management support tool," says Durbin. "Activities include tracking customer volume, current income, and comparative analyses of income year-by-year."



Daignault, Brown, Durbin

Serving Up the Right Information... at the Right Time

Connie Brown, Purina Mills Information Analyst, says the key business benefits of using the SAS System are "improved productivity by key field management and a consistent thought process in the use of management information. There is no question that field management spends less time gathering numbers and more time using good information to support the decision process. Mapping and graphical presentations are becoming more important in the decision process, and SAS Institute has been very supportive in helping us implement these tools."

"SAS software is doing the job for us," Daignault concludes. "All of our directors will eventually have it available."

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Lockheed Martin outpaces IS cuts

By Mitch Wagner

Lockheed Martin Corp. is beating expectations in its plan to slash IS expenditures this year.

The company, which was formed 14 months ago in a merger of Lockheed Corp. and Martin Marietta Corp., set a goal earlier this year to reduce annual information systems spending by $50 million. It plans to beat that figure by an additional 30% to 40%, said Joe Cleveland, IS chief at Lockheed Martin.

"We're looking at embarrassing improvements in what we predicted," Cleveland said. He is president of Enterprise Information Systems Co., the IS arm of the aerospace giant. The steeper savings won't be just a one-year deal, he added. Their cumulative effect should enable Lockheed Martin to far exceed the anticipated $700 million, five-year savings the Bethesda, Md.-based company projected in March when it outlined its plans for paring IS costs.

Lockheed Martin's Joe Cleveland: Cost savings even greater than planned

Merging two IS organizations

The aftermath of the late 1994 merger of Lockheed Corp. and Martin Marietta Corp.:

	Before	After
IS staff	3,500	2,600
Business units	12 independent business units	4 regional centers
Help desks	12	1

The savings are being achieved by combining multiple acquisition and maintenance contracts and standardizing wherever possible on preferred hardware and software packages, Cleveland said.

The firm plans to cut about a quarter of the 5,500 IS employees who were on the payroll at the beginning of the year. Lockheed Martin laid off about 600 people this year. By the end of the year, the company will merge about a dozen IS organizations that served independent business units into a single "virtual organization" that will serve the whole company out of four regional centers.

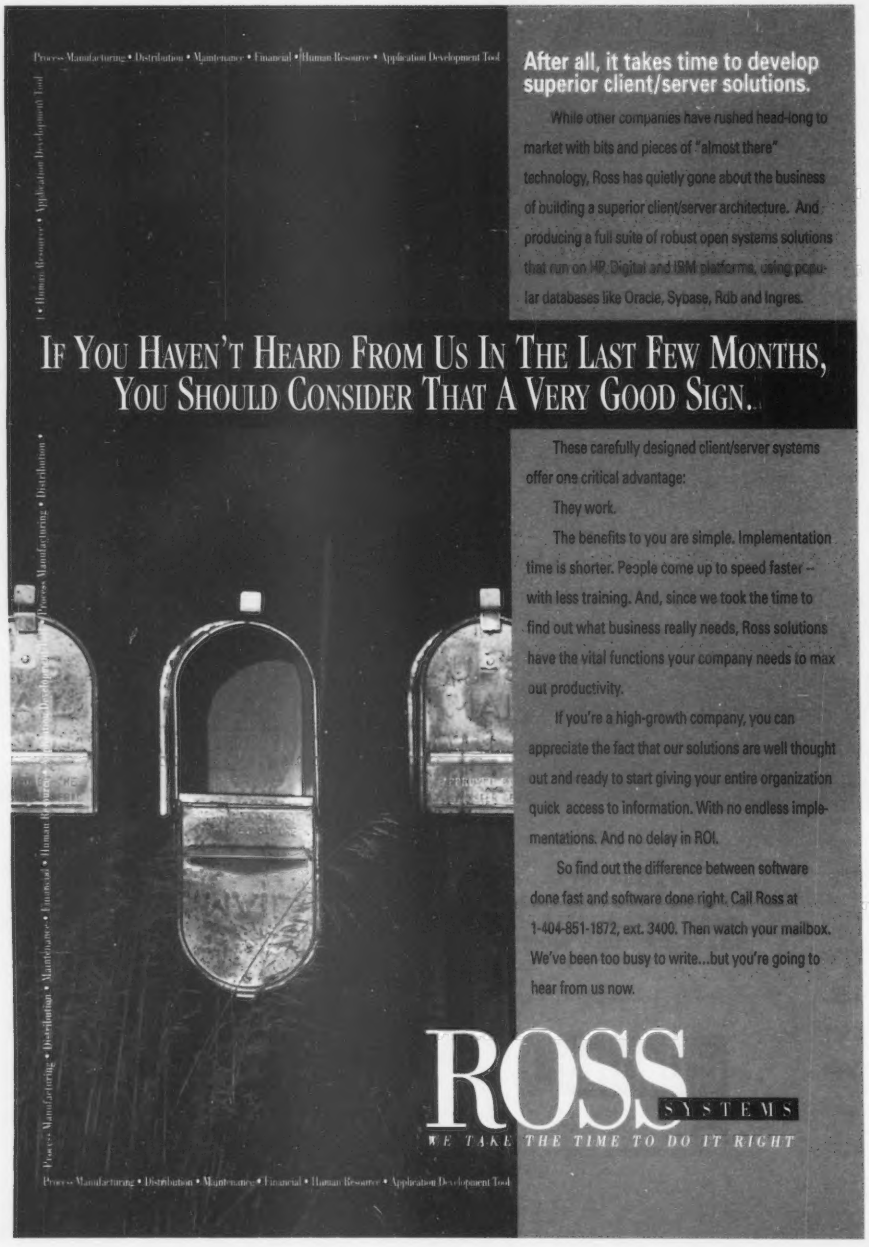
That rate of layoffs is fairly typical in IS organizations that experience corporate mergers, said Mark Hodges, senior vice president of G2 Research, Inc., a consultancy in Mountain View, Calif. "When people do [information technology] consolidations, you usually hear about [20% to 40%] cuts," he said.

Lockheed Martin is a $23 billion company with 170,000 employees — 19,000 of whom will be laid off next year as part of the merger.

Cleveland was appointed in March to oversee IS for the merged entity. He had been vice president and general manager of Martin Marietta's internal information systems.

As part of its cost-cutting, Lockheed Martin has outsourced desktop systems maintenance with BancTec, Inc., IBM and Computer Sciences Corp.

The company also will consolidate its system hardware, using Macintoshes and PCs from IBM, Dell Computer Corp., Compaq Computer Corp. and other major clone vendors. A proposal to ban Macintosh systems, which set off an uproar in the ranks of loyal Macintosh users a few months ago [CW, May 22], appears to have been abandoned.



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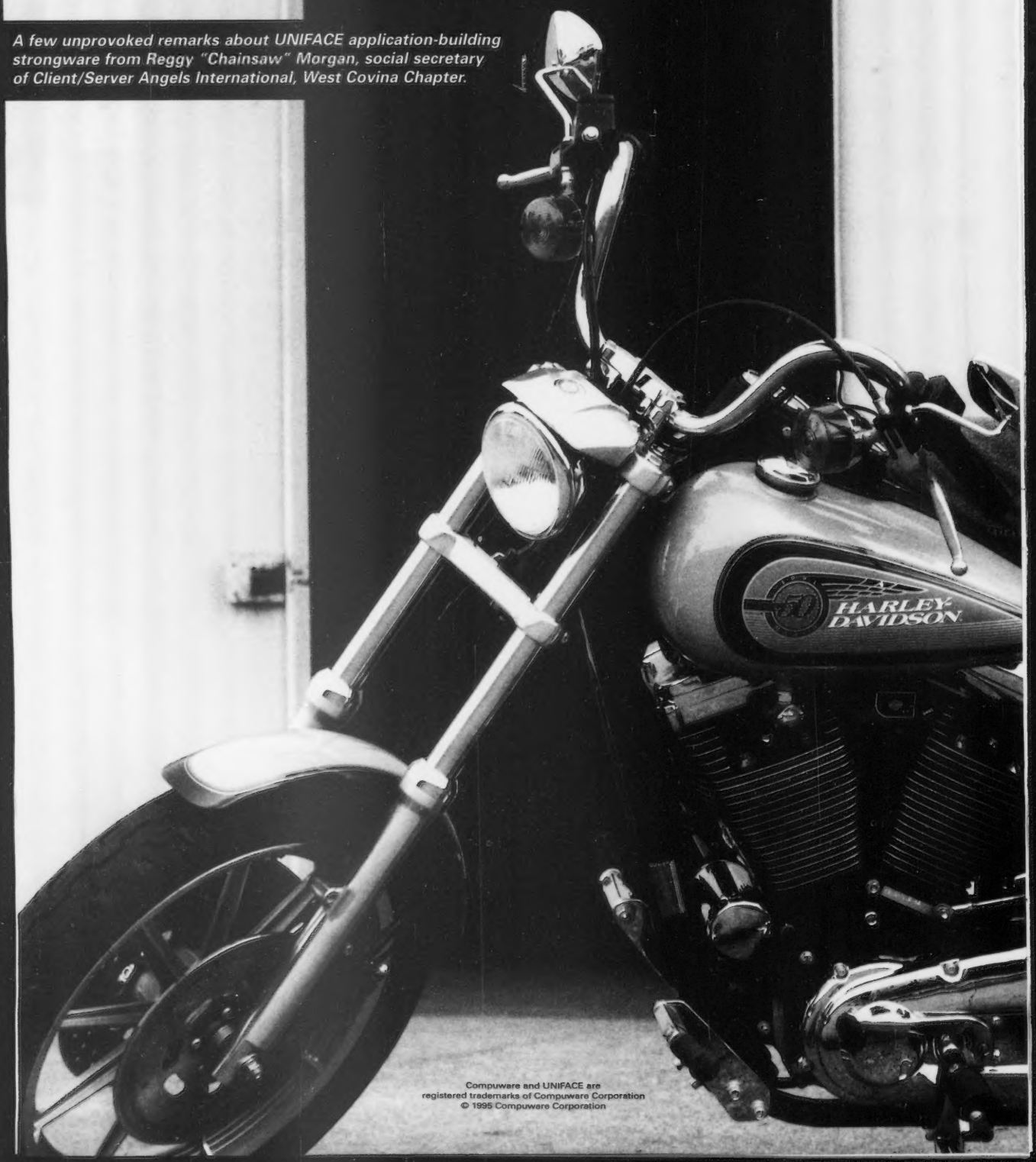
A few unprovoked remarks about UNIFACE application-building strongware from Reggy "Chainsaw" Morgan, social secretary of Client/Server Angels International, West Covina Chapter.



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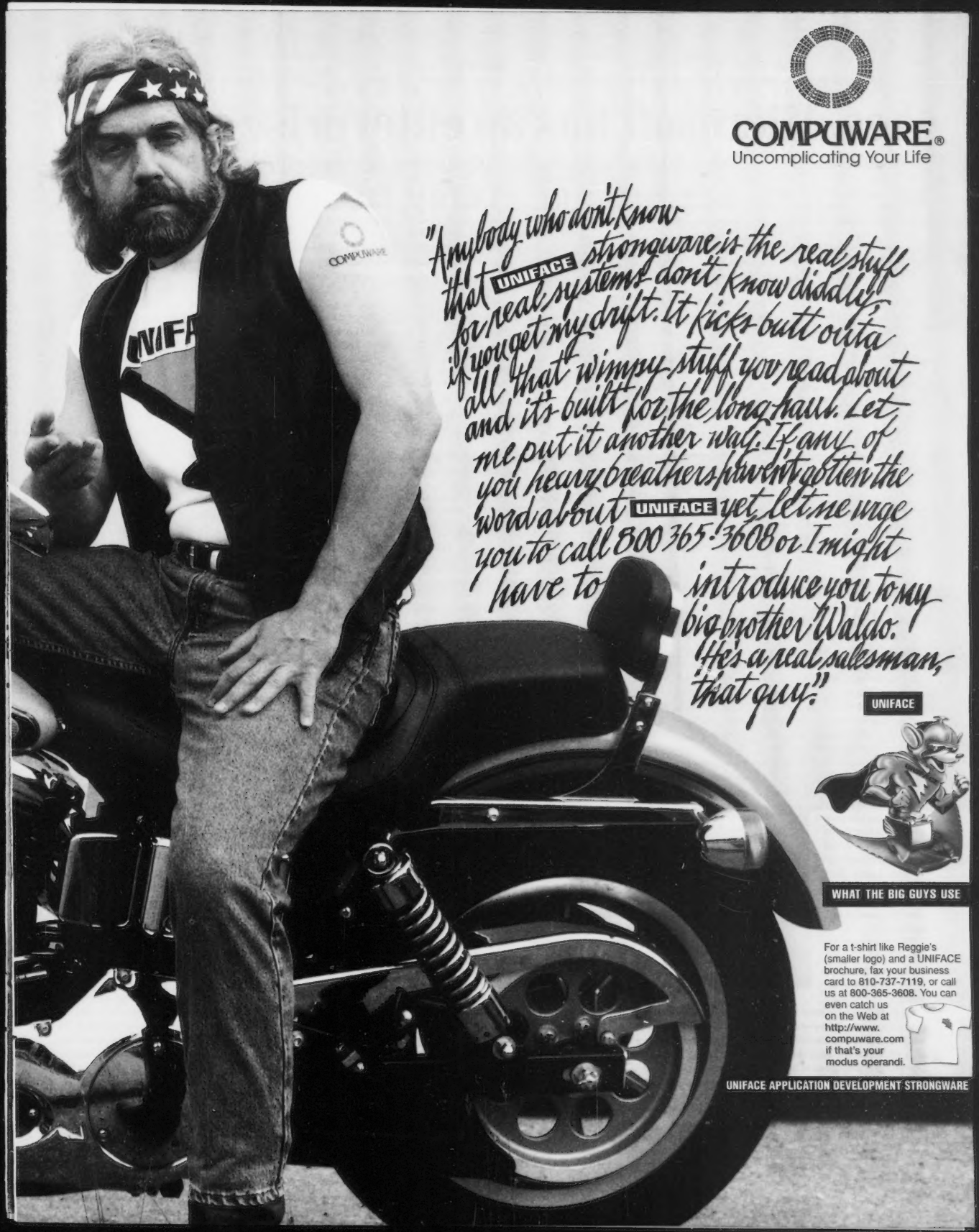
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UNIFACE APPLICATION DEVELOPMENT STRONGWARE

Yes, Microsoft has an enterprise strategy

Company lays out distributed computing agenda for future

By Stuart J. Johnston

Given that many users have indicated to *Computerworld* that they are confused about Microsoft Corp.'s overall strategy for enterprise computing, what follows is a rundown on what the company has said thus far.

Building on its dominant PC operating system and applications suite, Microsoft began extending its reach from the desktop five years ago. First, it built Windows NT Workstation and Server, a fully 32-bit system. It also wrote server applications to run on NT, bundling them into its BackOffice server suite.

Now, it is endeavoring to provide a soup-to-nuts set of enterprise offerings based on a PC-centric, distributed systems model.

Coming in 1996:

- The Exchange messaging server will replace the current Microsoft Mail server and provide an overall future messaging infrastructure.
- An interim version of NT will incorporate some Windows 95 features, including the new user interface.
- Internet servers that enable corporate information systems to conduct business over the Internet will ship.
- NT will add "fail-over" clustering so that if one in a pair of local NT servers fails, the other will pick up its tasks. Microsoft hasn't officially given a ship date, but sources say it is expected next year.

Late next year, Microsoft will begin beta-testing a major version of NT, code-named Cairo. Running about two years late, Cairo contains three key elements of the company's enterprise strategy — Network OLE, the Object File System (OFS) and a global network directory system.

Microsoft's OLE technology was originally designed to provide live links between applications running on a single PC. It has evolved into the key communications transport protocol for all future Microsoft systems integration.

For instance, with Network OLE, a user could establish a live link to mainframe data merely by dragging an icon into a spreadsheet or word processing document.

Tracking device

Meanwhile, the OFS is needed to store and track where information "objects" reside on the network. Together with a global network directory services system, these components will enable NT-based systems to "know" who everyone is and what information they are using. It will also provide them with transparent access to it, maintaining links and security.

Although Microsoft won't give a firm date for Cairo's release, many observers say it will be 1997. It was originally expected last year.

There are other pending developments, expected to appear after next year, that Microsoft hasn't given dates for.

They include the following:

- NT will gain so-called "shared nothing" clustering, which will let servers in different locations using different processor architectures function as clusters over high-speed networks.
- Also coming is an object repository, a database for corporate developers that keeps track of the code components used by enterprise applications.
- Software AG will provide Network OLE code to "wrap" corporate mainframe and minicomputer databases so that they appear as OLE objects to users' applications. Software AG said this will be completed in 1998.

And around 2000, Microsoft has said, it will merge Windows 95 and NT into one code base.

Anticipated delivery dates for Microsoft enterprise technologies

Internet Servers for Windows NT in beta	Exchange Server to ship	NT to get Windows 95 GUI	NT to get "fail-over" clustering	Cairo release of NT	Windows 95 or later version merges with NT
Q1 1996	First-half 1996	Mid-1996	Second-half 1996	1997	Around 2000

Gaining IS respect in enterprise

CONTINUED FROM PAGE 1

enterprise computing uses our building blocks [today], if you look at new systems design and what people have chosen when they're doing new work, a very high percentage of that is Windows NT and components of [Microsoft's] BackOffice," said Microsoft Chairman Bill Gates.

"We still have work to do, but people are sitting down and talking to us about their requirements, [and] they are looking at our building blocks and how they can fit in," he added.

The change in attitude also is reflected in the types of services being offered.

> "Now, when we have a problem, they have somebody here — boom."
> — Bruce Bemisderfer, GM's Saturn plant

Microsoft now offers corporate support for its products 24 hours a day, seven days a week, on a global basis, said Bob McDowell, vice president of Microsoft's Enterprise Customer Business unit. McDowell also has convened a consulting group that will have 1,000 engineers by the end of June. The company has recruited more than 10,000 systems integrators and resellers.

Some customers say they do perceive a change.

"When we started dealing with [Microsoft] in 1993, they didn't understand manufacturing," said Bruce Bemisderfer, manager of software development and strategic planning for manufacturing floor systems at General Motors Corp.'s Saturn automobile plant in Spring Hill, Tenn.

For example, Microsoft initially didn't understand how it affects Saturn when a server fails. Once Microsoft realized that Saturn loses $4,000 for every minute of lost production time, it really paid attention, Bemisderfer said. "Now when we have a problem, they have somebody here — boom."

NT controls many shop floor operations, Bemisderfer said, and Saturn plans to deploy most of the BackOffice suite. "If you want to tie the production line to the desktop, Microsoft makes sense," he said.

Other users say Microsoft is keeping its promises, but key elements are still in the future (see story above).

"We see [Microsoft's] enterprise structure, in a very primitive form, starting to take life with [the delivery next year of] Exchange" messaging server, said Briscoe Stevens, advanced scientific IS coordinator at NASA's Marshall Space Flight Center in Huntsville, Ala. "Do we see NT in a mission-critical role? Absolutely."

Still, the thought of standardizing client and server on just Microsoft products continues to give many IS directors pause. In fact, many users find Microsoft's commodity pricing model compelling enough to seriously consider NT, but not enough to make them switch from Unix in the near term.

Bill Schimoler, vice president of global LAN services at The Chase Manhattan Bank NA in New York, said Chase prefers to remain a multivendor shop.

He said one attraction of NT-based systems, however, is the off-the-shelf applications on the client and server that free up IS resources for custom applications.

"I think we see NT co-existing with Novell and Unix. For the near future, co-existence is going to be the most common approach in a large enterprise where there are hundreds of LANs," said Eric Singleton, director of IS at Allied Technical Services Corp., a division of AlliedSignal, Inc. in Columbia, Md.

Corporate IS managers playing wait-and-see game with Windows 95

By Stuart J. Johnston

Windows 95 migration

For corporate information systems managers, the real message about Microsoft Corp.'s Windows 95 is "Hurry up and wait."

While IS sees adoption of Windows 95 as something akin to inevitable, managers still plan to hold off until after Microsoft issues the first of its so-called service packs early next year.

A recent survey of 50 chief information officer-level managers by Forrester Research, Inc. in Cambridge, Mass., found that 86% will migrate all or some of their desktop PCs to Windows 95 within two years.

Slow migration

Another recent poll, this one by corporate reseller Stream International, Inc. in Norwood, Mass., surveyed 60 corporations that participated in the Windows 95 beta or Preview programs. About 82% said they plan to switch over more than half their PCs by the end of 1996.

"From a corporate perspective, we're still hanging back," said Bruce Benham, vice president of IS at Re/Max International, Inc., an international real estate franchiser based in Englewood, Colo.

Cost is a big factor for Re/Max's 300 PCs.

For many users, a lot hinges on Microsoft's first promised service pack — essentially a maintenance release — which will likely be available in the first quarter of next year.

Microsoft officials said they will bundle new device drivers and bug fixes into an interim release of the product, called a service pack, early next year.

"Most of the corporations that we deal with are waiting for a maintenance or service release of Windows 95," said Colleen McCormick, a research associate at Gartner Group, Inc. in Stamford, Conn.

Microsoft moves to make SQL Server a tool for the enterprise. See page 55.

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Computer Industry

Briefs

Arbor IPO hot

Arbor Software's initial public offering (IPO) last week was followed by one of the largest-ever stock price gains in first-day trading. The Sunnyvale, Calif., maker of on-line analytical processing tools had its stock open at $17 and close at $39.25 — a gain of 131%. The record holder is **Videolan Technologies**, which gained 322% in its August IPO. **Netscape Communications Corp.** rose 108% when it went public.

Cirrus stock drops

Stocks of specialty chip maker **Cirrus Logic, Inc.**, took a battering last week after one of its largest customers — widely believed to be **Intel Corp.** — reduced orders for certain graphics and audio chips. The Fremont, Calif.-based company warned investors that this will reduce the rate of revenue growth and operating profits by approximately 10% to 15% for its quarter ending Dec. 30. Cirrus' stock plummeted by as much as 31%.

Toshiba invests

Toshiba Corp. said it will make a $4.5 million equity investment in **Geoworks, Inc.**, a software firm in Alameda, Calif. The companies will jointly develop products in the mobile communications arena.

Intuit buys Galt

Intuit, Inc. last week said it will acquire **Galt Technologies, Inc.**, a provider of Internet-based mutual fund information through its Networth service.

SHORT TAKES **Storage Technology Corp.** Chief Executive Officer Ryal Poppa will retire from active management of the company in January 1997. ... **Tallgent, Inc.**'s acting CEO Richard Guarino died of a heart attack on Oct. 28.

Banyan revamps

Firm plans 10% layoff and Internet focus

By Laura DiDio

In the wake of two consecutive quarterly losses, Banyan Systems, Inc. last week announced a 10% layoff of its workforce and plans for a companywide reorganization focused around Internet services.

About 80 workers will lose their jobs. They are mostly located in the Westboro, Mass.-based firm's newly created Enterprise Networking division.

In addition to this division, which oversees the Vines and ENS network operating systems and the BeyondMail messaging offerings, Banyan has created the Internet Business division, said John Paul, senior vice president of Banyan's Internet Products division.

"Banyan has scaled its business and taken the actions necessary to return to profitability by the 1996 first quarter," he said.

There was little surprise at the shake-up, given the drop in Banyan's income and revenue in fiscal 1995. In its third quarter, ended Sept. 30, the company posted a net loss of $4.3 million.

Revenue in the same period declined 20%, to $31.2 million, compared with nearly $39 million in sales for the same period last year.

Continued losses

Rich Edwards, an analyst at Robertson Stephens & Co., a San Francisco-based investment firm, said the decline in revenue and earnings were more precipitous than expected. He predicted losses will continue for at least the next two quarters.

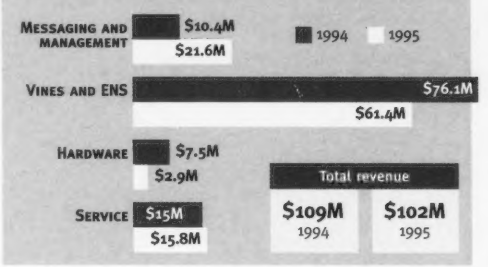
The bright spot for Banyan this year has been in its BeyondMail messaging offering, which more than doubled its revenue. However, it is the decline in the core Vines revenue that most worries even longtime Banyan loyalists (see chart).

"It's a question of how long can we stay with a sinking ship," said one stalwart Vines administrator at an East Coast defense contracting firm.

"Vines has been a great network operating system, but it's harder to justify sticking with it, given the limited number of applications available and the growing strength of Windows NT Server. The uncertain financial picture just about clinches [a switch] for me," he said.

Running down

Banyan's revenue for the first nine months of each year



Compaq buys Networth to boost networking expertise

By Jaikumar Vijayan
and Bob Wallace

It looks like internetworking is becoming a major hub in Compaq Computer Corp.'s route to the enterprise.

The Houston-based company last week announced plans to acquire Networth, Inc., a manufacturer of Ethernet switches, 100M bit/sec. Ethernet hubs and related network management products. Networth is based in Irving, Texas.

The proposed $372 million acquisition comes barely a month after Compaq bought privately held Thomas-Conrad Corp. for an undisclosed sum. Thomas-Conrad makes network adapter cards.

These moves signal an acceleration of Compaq's efforts to integrate increasing amounts of internetworking hardware and software into relatively low-cost, industry-standard PC architectures, said Doug Pushard, vice president of Compaq's newly formed Internetworking Products Group.

Providing such connectivity to enterprisewide networks is vital to Compaq's long-term strategy of pushing its PCs and servers deeper into mission-critical roles, observers said.

The Thomas-Conrad purchase further signals Compaq's growing ambitions in the internetworking business, observers said. Earlier this year, the firm allied itself with Cisco Systems, Inc. to develop routers based on Cisco's Internetwork Operating System software and Compaq's servers.

Internetworking

Those moves jibe with Compaq's plans to become a one-stop supplier of client hardware, servers, network interface cards, routers, hubs and network management software.

"Acquisitions like these save Compaq a whole lot of time in reaching their goal" mostly by providing instant access to technologies the firm would otherwise have to spend time developing, said Jennifer Munson, an analyst at Workgroup Strategic Services in Portsmouth, N.H.

Skeptical analysts say Compaq faces substantial challenges in its bid to become a more strategic supplier.

"The first obstacle is a management issue. The people who sign on the dotted line for new PCs and adapter cards aren't the same folks who are making the overall technology direction decisions for companies," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J.

"It's the network managers who are making those decisions. They choose which vendor's technologies — switching, routing and backbone networking — fit into the enterprise network and where," Briere said. "So they won't buy it all from Compaq just because that's where they get their PCs and servers."

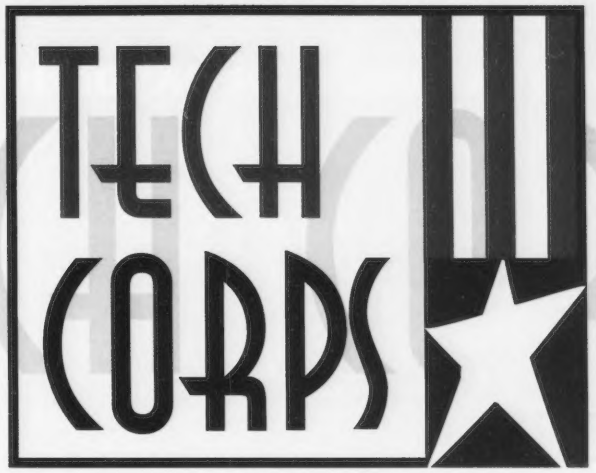
As an internetworking vendor, Compaq also will face an uphill battle against established giants such as Cisco, 3Com Corp. and Cabletron Systems, Inc. Networth will give Compaq immediate access to its Fast Ethernet technology, but Networth has been a fairly small player in the highly competitive internetworking arena.

"As a stand-alone enterprise, Compaq probably overpaid [for Networth]," said Kurt King, an analyst at Montgomery Securities, Inc. in San Francisco. "But Networth is a much stronger player as a part of Compaq. The economics [of the deal] come a distant second in comparison to the longer-term opportunity they bring to Compaq."

Market maneuvering

The following are Compaq's alliances and acquisitions to help the company move into the internetworking arena

VENDOR	OBJECTIVE
Cisco Systems	Alliance to develop and manufacture routers based on Cisco's Internetwork Operating System and Compaq servers.
Thomas-Conrad	Acquisition for an undisclosed sum to integrate and sell a range of network interface adapter cards.
Networth	$372 million acquisition to integrate and sell Fast, or 100M bit/sec., Ethernet hubs and switches and related network management products.



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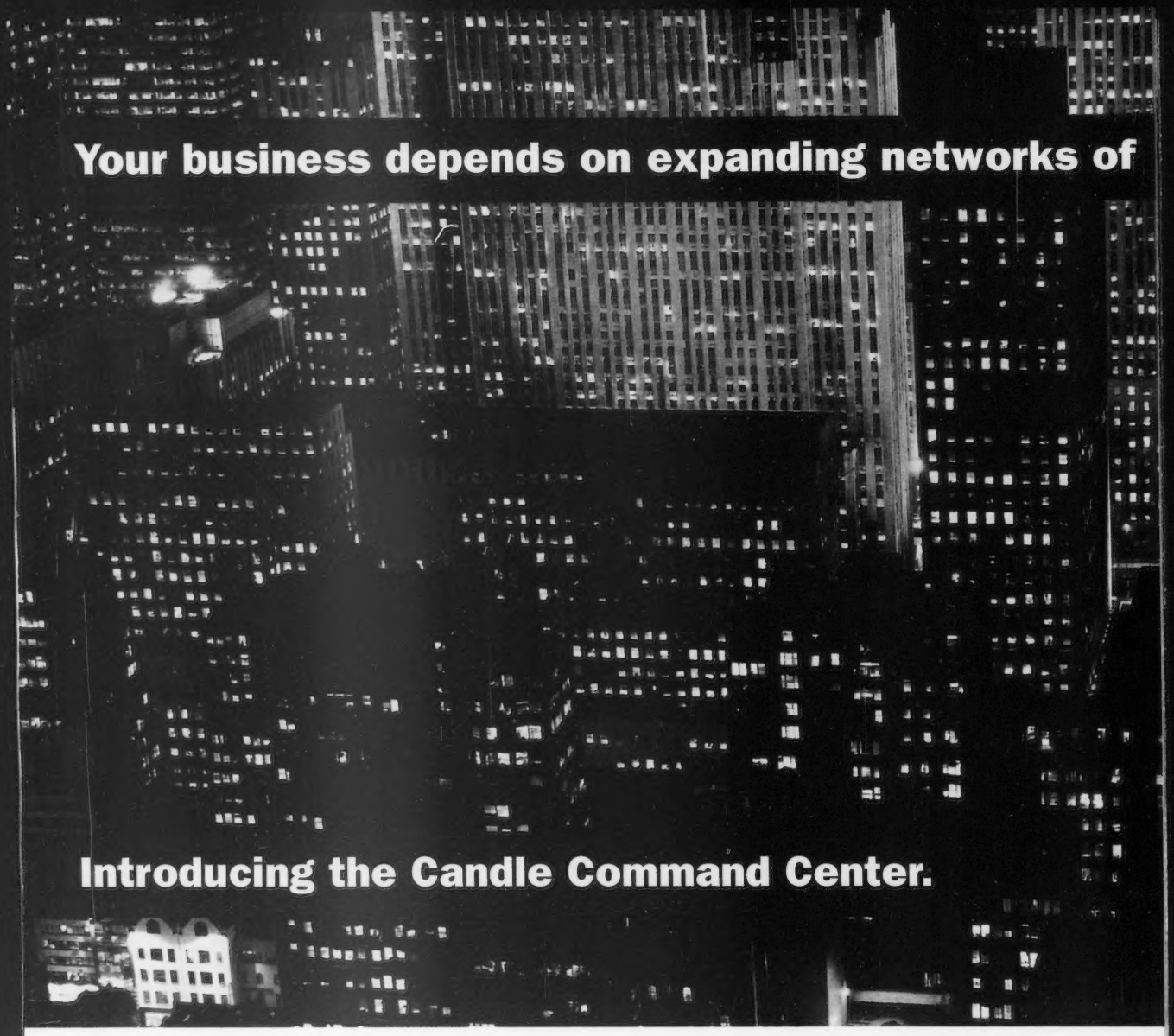

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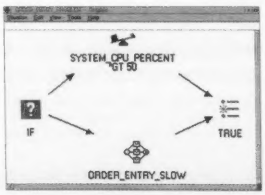

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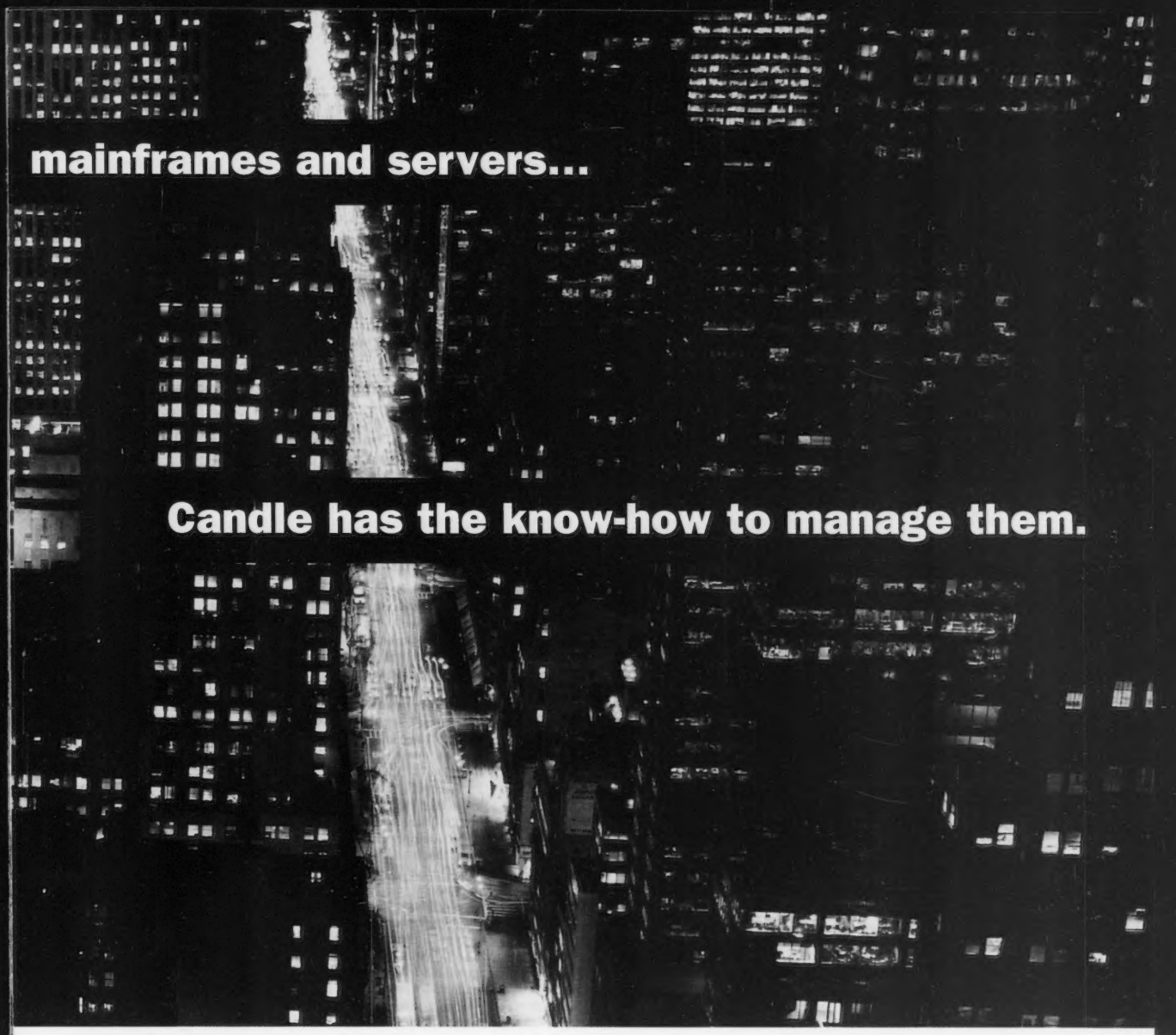

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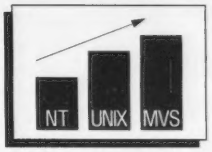

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Loyalty strikes out

Baseball fans will remember Curt Flood for a few reasons. For one, he was a heck of a player.

But more important to the history of the game, Flood's insistence on playing for the team that was willing to pay the most for his services ushered in the era of free agents in sports. Apart from creating absurd situations, such as a basketball player's recent refusal to play for a paltry $10 million per year, free agency has revolutionized modern professional sports.

Attention IS managers: Hold on to your checkbooks. Free agency is coming to an IS shop near you. And I believe the impact of free agency will be as profound in the IS environment as it has been in professional sports.

Our first annual IS Skills Survey, which begins on page 100, clearly shows that the seeds of free agency have been planted. The supply of good IS talent, the kind of talent needed to fill the growing number of specialized jobs in the distributed environment, is overwhelmed by the demand for that talent. The results? Salaries for the hottest skills are going through the roof. Moreover, IS staffers with the proper training in these hot skill sets are free agents who are in as great demand as left-handed starting pitchers.

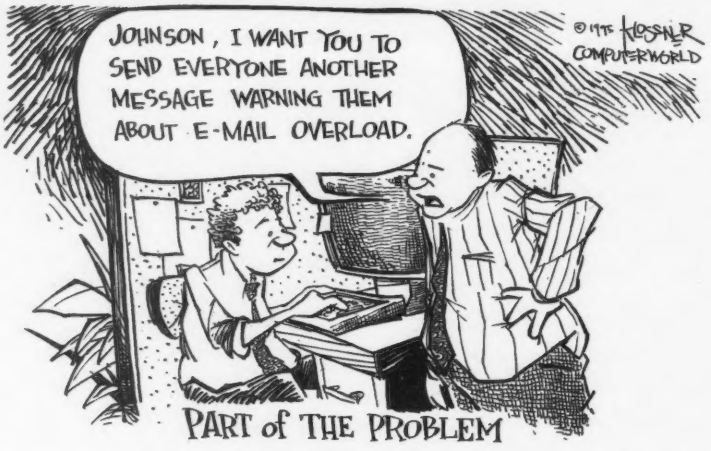
Furthermore, thanks to the downsizing business philosophy of the 1990s, characterized by sudden and massive layoffs, "company loyalty" is scarce. So if Mr. 30-Year-Old with three years of Notes experience hears the siren song of a 50% salary hike with a $5,000 signing bonus from the consultant who was helping to set up your Notes installation, he's history. That is exactly what is starting to happen. To some extent, you'll say this is nothing new. But I predict that the inability to keep permanent IS staff with the most-needed job skills will result in a restructured IS environment.

There will be far more reliance on consultant crash teams for installation, ongoing support and maintenance of mission-critical systems. And offshore programming teams will look increasingly attractive to beleaguered IS managers seeking to jump-start client/server applications.

The seeds of all these changes are apparent in our report. Play ball! And bring plenty of moolah.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *bill_laberis@cw.com*



Letters to the editor

Don't forget reorganization

Viewpoint columnist Michael Cohn left out the most important "R" for dealing with the century date problem ["Dateline 1999: IS pros retire in droves," CW, Oct. 30].

Reorganize. Yes, decentralize your IS processing.

You'll be a hero to the chief executive officer for stepping up and saying the frontline people can do it better. They are closer to the action. They can keep up with the business changes faster than a bunch of propeller-heads in the basement, anyway.

And the new synergy will drive your company to undreamed-of heights.

Bill Carrigan
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NOS comparison irresponsible

Your methods for comparing network operating systems ["The CW Guide to Network Operating Systems," CW, Oct. 23] are some of the most irresponsible I have ever seen.

You ignored some key features, such as single point of administration, full-featured file systems not based on old-style file systems, true IP support (not NetBEUI-encapsulated) and true fault-tolerant hardware capabilities.

The paragraph about symmetrical multiprocessing (SMP) is ludicrous.

I have seen Novell's NetWare SMP and Microsoft's Windows NT. They are similar in performance in dual-processor configurations. But once you get above three processors, NetWare blows NT away.

SMP NetWare isn't shipping yet, but some vendors' products will ship by year's end.

Furthermore, it is irresponsible to state that the lack of SMP support of NetWare may be one reason why NT outperformed NetWare. It's like *Road & Track* magazine saying the Corvette's dual 454 engines may be one reason it blew away the Mustang with a single 5.0-liter engine.

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Get their numbers

I was most interested in the saga of Cracker Barrel's webmasters, who have constructed an internal corporate database front end on a World Wide Web foundation ["Data warehouse rests on Web frame," CW, Oct. 30].

Even more intriguing than their internal Internet approach is their accounting practices, by which "11 designers, developers and network engineers" could be assigned to a month-and-a-half-long project that, nonetheless, cost the company less than $10,000.

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Age rage

Josh Cohen's quote "Hire twentysomethings for Web work" should *not* have been put in print ["Webmasters: Young cyberwizards strive to conquer on-line world," CW, Oct. 23].

It is a direct call for age discrimination.

The rest of the article says nothing about age as a factor. It seems that desire and ability are more important.

I am saddened to find that a fine periodical could print such damaging statements.

Joe Toth
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As a fiftysomething who does work on the Web (see the 'zine at http://www.match.com), I found the "Hire twentysomethings for Web work ..." tag on your cover way out of line.

A good dose of maturity is often useful.

Anne Wayman
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wayman@well.com

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Nathan Myhrvold

A dumb Web terminal is just a dumb idea

A bare-bones appliance couldn't run today's PC software or new Web browsers

It's fashionable to say that the next computing platform will be some sort of limited "Internet terminal," a $200 to $500 device for Internet browsing. Despite the hype, this is a fundamentally bad idea that is doomed to fail.

The purported advantage is cost — getting on the 'net for a lot less money. That would be interesting if it were true, but the proposition doesn't hold water. To start with, how can an Internet terminal cost less than a PC? The PC industry is perhaps the most competitive and cutthroat high-tech market there is, with famously low margins. The various PC components are about as cheap as you're going to get, unless you dramatically slash functionality.

Well, you could get rid of the display and press the family TV into use. However, you'd create a lot of hassle and get unreadable text, so it hardly seems practical. The only other place to cut is the CPU (down to 386 or 486 levels), RAM (down to 4M bytes) and disks (none), which severely compromises the machine. Modern PC software won't run with these constraints. Why should users live with a circa-1990 word processor and other applications? Why should anybody re-create them?

Unfortunately, the same limitations mean the Internet terminal — running at one quarter the speed of a PC with severe limits on functionality — won't be much good at Web browsing, either. Because of new value-added features and applications, the memory used by a typical Web browser has more than doubled in just the past six months. How will future Internet software fit on a limited "Internet terminal"?

There are more than 100 million PC owners who are *not* on the Internet yet, and these folks will be the next 100 million denizens of the 'net. The cheapest method to join isn't a $500 box — it's a *free* piece of software.

PAMELA HOBBS

Conversely, people without a PC now have a new reason to buy one. The PC is already the world's best-selling consumer electronics device, and it just got a new and dramatic feature (Internet access) for no increase in cost.

Suppose you run a Web site a couple of years from now. You can use cool new data formats and features available on 100 million-plus PCs. Or you can drop to the old lowest common denominator just to get a tiny number of "Internet terminal" owners. Why hurt the popularity of your site with the mass market to go after the tiny one?

There are two fundamental delusions in the "Internet terminal" dream. The first is that a PC is "too expensive." No market data supports this. To the contrary, PCs are selling faster than ever before, especially into the home. This argument is like saying cars are too expensive, so instead we will all drive motor scooters. Most of us dig a little deeper into our wallets to get seats, a roof over our heads and so on.

Manufacturers have experimented with cheap, bare-bones PCs for 20 years, but nobody buys them. Given the choice, people dig a little deeper to get more CPU power, Super VGA graphics, multimedia or the cool feature du jour. Consumers spread this investment across many applications, so the perceived cost is low.

Second, and far worse, is the premise that the Internet is a limited and static world. In order to reach its full potential, the Internet (and associated software) will evolve enormously over the next decade. Locking today's Internet into a limited terminal is a vote against this evolution.

It's really a very depressing and small-minded vision.

Myhrvold is group vice president of applications and content at Microsoft Corp. He also manages Microsoft's research laboratory.

John Gantz

Road warriors: Big pains, big gains

Outfitting the on-line mobile worker is costly, but the payoff is great

Finally, I think we have empirical proof of Metcalfe's Law. You know Metcalfe, as in Dr. Bob, inventor of Ethernet and columnist at *InfoWorld*. His law says the cost of a network increases in proportion to the number of nodes, while the value of the network increases in proportion to the square of the number of nodes. In short, the more people on a network, the more valuable it becomes.

The proof comes from a study of mobile computing at 400 large U.S. companies. From it we get the following insights:

- The average portable computer pays for itself in 20 months, while the average portable computer equipped for and using electronic communications pays for itself in 16 months. The monthly cost/benefit ratio was much better for communicating portables.
- The more frequent the communications — about 25% went on-line more than once a day — the faster and higher the payoff.

The implications are clear: From the get-go, you should make communications the design point of your portable applications. And you should put in place the networking and support infrastructure you need to support road warriors. The better you can replicate in the field the access to networked resources that users have at their desks, the quicker and greater the financial returns.

The help desk will need more staff and longer hours to support mobile computing.

In our survey, electronic mail was the No. 1 application for communicating portables, but access to company databases was only a hair's breadth behind. File transfer and remote LAN access were right up there as well.

The research revealed that the mobile computing infrastructure and support will vary by application. Users who worked mostly on their portables nights and weekends at home had different requirements than those who used them while traveling. Sales representatives had yet another set of needs.

What does all this mean in practical terms?

One, you'll need more support staff for mobile users. If one IS support person serves 40 deskbound end users in your organization, you'll need one for 25 remote users.

Two, you'll need longer hours on the help desk. Our research indicated that more communication from portables takes place after hours and on weekends than during regular weekday hours.

Three, you'll need to increase formal training for remote users by 50%. At a minimum, plan on 10 hours per year, per user, just to train on hardware, operating system and basic office suite applications. Custom business applications might require two to three times that.

Those are costly steps, but that is how you leverage the investment. The more you put in, the more you get out. A dollar spent on extra training leads to $3 gained in productivity or lower costs. Giving employees portable computers allows them to manage individual productivity, but giving them *networked* portables lets them increase their own productivity and the productivity of those with whom they interact electronically.

Although mobile workers are a fraction of the total worker population, taking special pains to support them can be worth it. In our study, more computers were used at home nights and weekends than actually on the road, and most employees logged an extra four to six hours of work per week.

And get this: Despite longer hours, their morale improved. Now there's an unexpected corollary to Metcalfe's Law.

Gantz is a senior vice president at International Data Corp. in Framingham, Mass.

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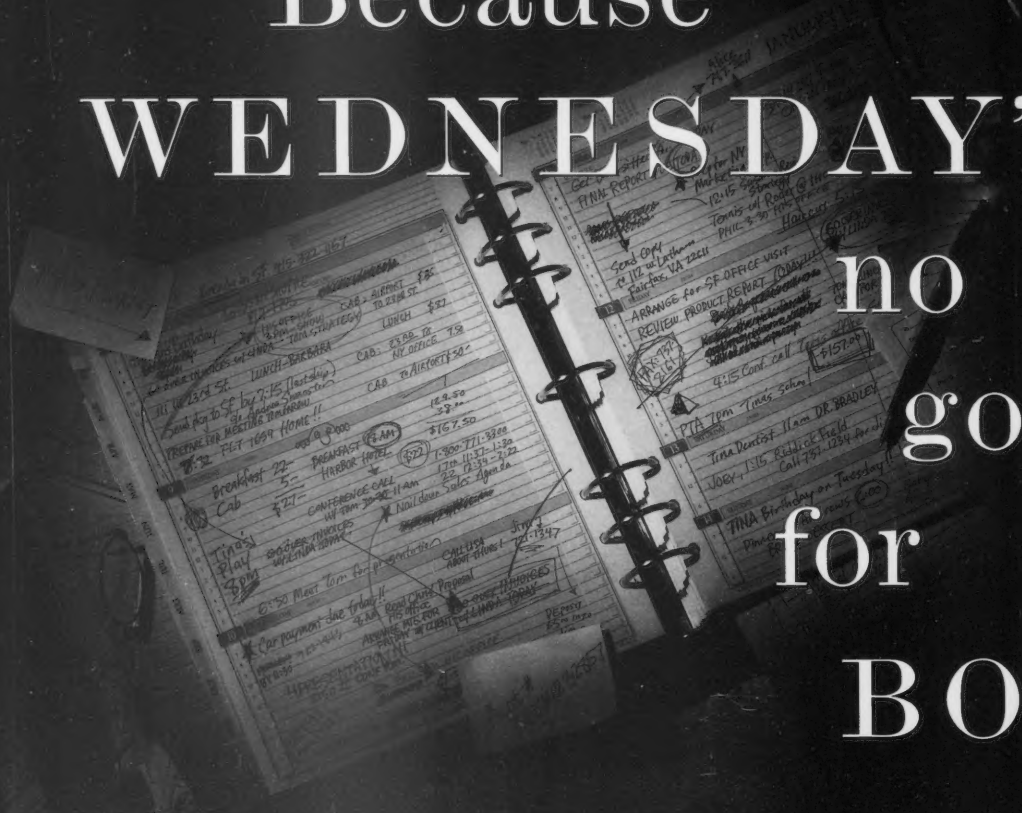

ORGANIZER 2.1 WITH GROUP SCHEDULING.

There's some kind of cosmic waffle rule that applies to business meetings: if you reschedule once, you will have to reschedule a dozen times. Because if it isn't Bob, it's Joan, or Gayle or Jorgé. And meanwhile, the perceived importance of any meeting is inversely proportional to the number of times it is pushed back. It's been proved.

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IBM TO MAKE MICROKERNEL TECHNOLOGY AVAILABLE, 46

Lotus stays the course

Newly appointed presidents detail how the company will stay on top and expand interests

Lotus Development Corp.'s Michael Zisman and Jeffrey Papows — Jim Manzi's successors to the newly created office of the president — talk with senior writer Suruchi Mohan about Novell, Inc.'s plans to divest itself of WordPerfect and other issues.

CW: Many users and analysts say that in light of Novell's plans to sell off WordPerfect, Microsoft Corp. is their only choice because now it owns the applications market. What would you tell those users and analysts?

Jeffrey Papows *says Novell's divestiture of WordPerfect should help Lotus*

ZISMAN: That's obviously not true. In fact, the applications business is a substantial business and has been increasing in unit volume year by year. We expect it to continue. Novell made a decision to exit; that's their choice. It doesn't indicate that it is our choice or our intent.

PAPOWS: I think their exiting helps us, and I think that in a market like this — where monopolies do no one any good in the long run — there's always going to be room for two vendors.

CW: WordPerfect users we talked with said they have no choice but to go with Microsoft. Not one mentioned Lotus. Assuming Lotus does want that migration business, what are you going to do to win these people over?

ZISMAN: I think a significant portion of WordPerfect customers are using 1-2-3, and if they're using 1-2-3, many of them are using other components of our suite and would naturally move to the suite.

CW: Does Lotus have any plans to purchase all or any WordPerfect applications?

ZISMAN: Obviously, we would not and could not comment on that.

CW: Are there any plans to drop any Lotus applications or to sell or discontinue them?

ZISMAN: No, there are none.

CW: Are there any new areas that Lotus will now turn its attention to now that it has IBM's technical and financial resources behind it?

ZISMAN: We've been fairly open in talking about our plans in what we call the extended transaction model space, tightly integrating most applications with the whole backroom environment — whether it's IBM or other vendors. You can expect us to compete very aggressively.

We've also announced some of the activities that are going on in the component area as a natural evolution from the large suite business.

Michael Zisman *says he will be more involved in setting technical direction*

CW: How would your style differ from Jim Manzi's?

ZISMAN: It's hard to talk about that. As time goes by there will clearly be differences, not better vs. worse. I'm far more technically inclined than Jim was, for instance. I will be much more involved in setting technical direction for the company. I think it will by nature be different with Jeff and I working together on this. You get a different sort of balance.

CW: Users are making comparisons between Notes and the World Wide Web. What must Lotus do to differentiate itself?

PAPOWS: We view Notes as the application development staging platform for the Internet. It provides a greater range of access and information. Even the best browsers don't deal with things like local storage and mobile support; we can bring a range of complementary value.

ZISMAN: I would argue that today the base capability for a mail system is a local message store. A browser today does not do that. A browser has no local store. Can you add a local store to a browser? It's just a matter of programming. Once you do that, that browser is a little bigger, a little heavier, a little more complex, a little more difficult to install.

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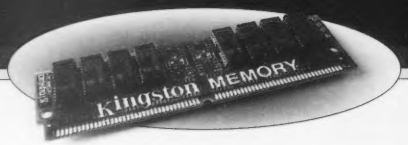

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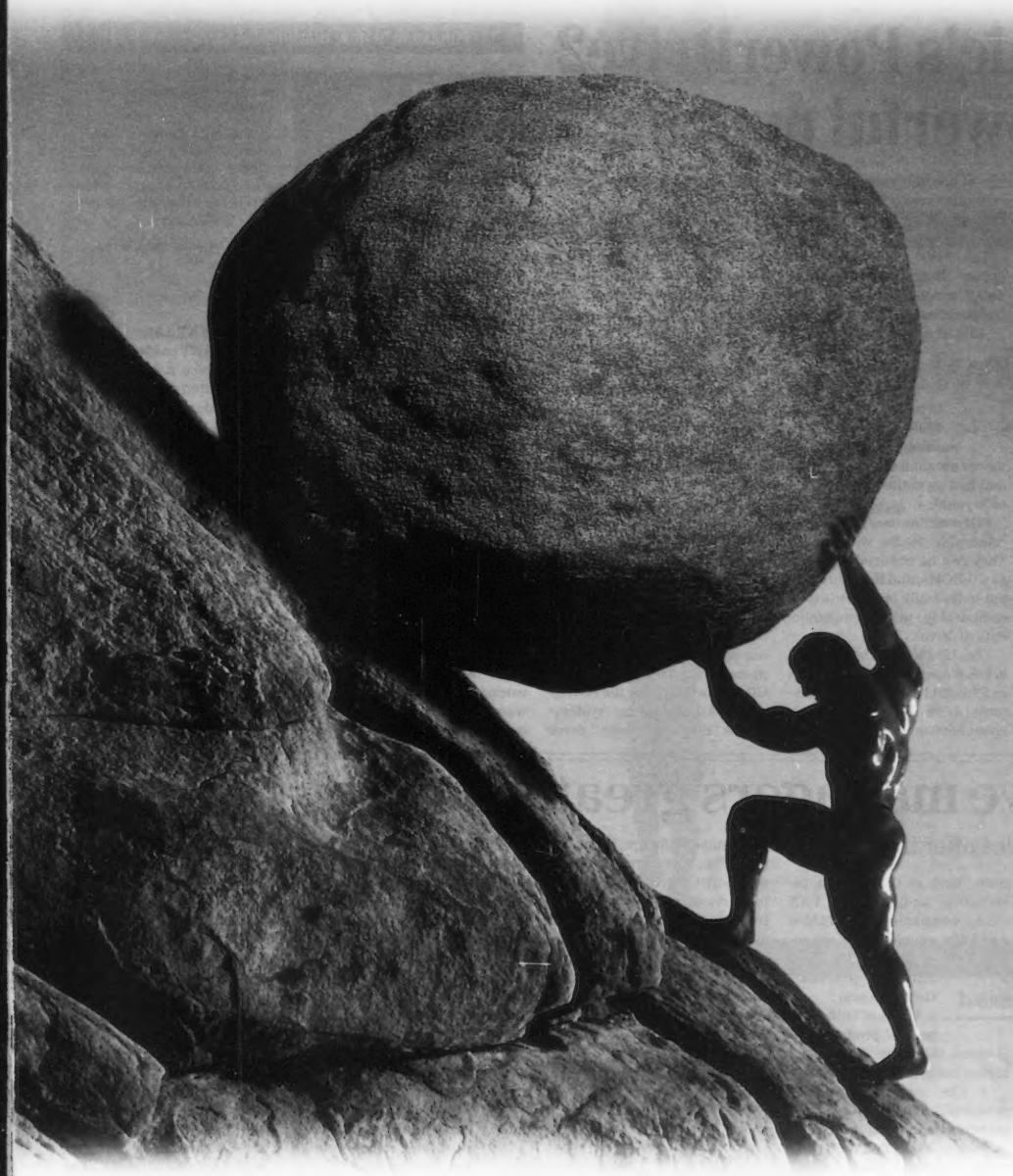
*Ziff-Davis study, PC Computing, November 1994. Kingston Technology Corporation, 17600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 435-2600, Fax (714) 435-2699.



These days, you can sum up the human condition like this: too much work, not enough time. Computers, of course, are supposed to ease the burden. But now, with all the new memory-hungry software out there, many computer systems aren't up to the task. Fortunately, there's a simple solution: add more memory. Recently, an independent study* revealed that by adding just four megabytes of memory, the average manager became 26% more productive. The average number cruncher improved by 12%.

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Panasonic's PowerDrive2 packs powerful punch

By Chris DeVoney

Panasonic Communications and Systems Co.'s PowerDrive2 storage device provides CD-ROM capability and 650M bytes of removable, rewritable optical storage in a single disk drive.

This setup is ideal for people who need a CD-ROM drive (and as more software becomes available in CD-ROM format, this is becoming the case) or for people who need removable media for daily backup. If your company uses huge photographs or computer-aided design drawings, here's a way to archive quickly.

REVIEW

PowerDrive2 delivers single- to quad-speed playback performance, which is sufficient for even arduous multimedia needs. It also handles most multimedia formats, including audio CD, CD-XA, multisession Photo CD, CD-I and Video CD. The latter two "movie" formats are supported only if the host computer uses a Motion Picture Experts Group hardware accelerator.

The "PD" in PowerDrive2 comes from "phased-change disk," which refers to the cartridge-encased optical discs that are read and overwritten by the drive's laser. Each PD cartridge holds 650M bytes of data (about 630M bytes after formatting). It requires no more care than standard media and has an estimated life span of 30 years.

PDs combine the advantage of removable media with speed. They can be changed as easily as CD-ROMs, and their throughput is typically twice as fast as comparably priced magneto-optical drives.

The LF-1004 is the internal drive. It costs $499.95 and fits a half-height bay. The LF-1000 external drive costs $649, which is about $500 more than a similar quad-speed CD-ROM drive. However, the extra cost (50 cents per megabyte) puts it within the price range of many LF-1000 medium-capacity, removable-media drives. And the media itself (five cartridges for $300) costs $1 per 10M bytes.

The drive "kits" contain the SCSI-II drive; Corel Corp. SCSI drivers for DOS, Windows 3.x and the Macintosh; the Corel Sampler CD-ROM; a SCSI-to-SCSI-II cable; a PD cartridge; and documentation. OS/2 drivers can be downloaded from Corel. The drive is plug-and-play-certified for Microsoft Corp.'s Windows 95 and is recognized by Windows NT's APSI SCSI drivers.

Little annoyances

Using a dual-use drive isn't without its quirks. The operating system assigns two drive names to the devices, one for the CD-ROM and one for the rewrite discs. All operating systems give a "drive not ready" error when the wrong drive is accessed — and this can happen fairly easily with PowerDrive2's two-for-one drive setup. An error message pops up, for example, when you type in the CD-ROM drive's letter when a PD cartridge is mounted in the drive.

Also, the PD disks format in a minute or so, but verifying the format can take more than an hour.

In our tests, the Corel DOS/Windows 3.x APSI driver and CD-ROM extensions installed easily but took about 70K bytes of memory, a drawback for RAM-crammed networked computers. The drive was recognized and used without intervention under Windows 95 and NT 3.51.

Windows NT caused a bit of a bump because it couldn't read PDs formatted under Windows 3.x or Windows 95. The current resolution that Panasonic confirmed with us during our testing is to format the PD under NT's Disk Administrator.

The long-term solution is a Panasonic-provided NT driver scheduled for delivery early next year. If disks aren't exchanged by Windows and NT machines, the problem is moot.

PowerDrive2's two-for-one capability fits any situation where removable storage and CD-ROM capability are needed.

Devoney is a freelance writer in Seattle.

Panasonic's new dual-media storage device

PowerDrive2
Panasonic Communications and Systems

This dual-duty storage device combines CD-ROM playback and 650M-byte removable, rewritable optical disc technology at a price that is competitive with a quad-speed CD-ROM drive.

Requirements: SCSI or SCSI-II adapter; Microsoft's Window 3.1, Windows 95, Windows NT 3.5 or Apple's Mac OS

Price: $649 (external); $499.95 (internal)

Suites give managers greater control

McAfee, Tally upgrades offer integration

By Cheryl Gerber

Two software utility makers recently introduced desktop suites that could help information systems managers gain better control of distributed PC hardware and software.

Systems management

McAfee Associates, Inc. in Santa Clara, Calif., released Saber LAN Workstation 5.5, a systems and network management suite that integrates Saber Software Corp. products from McAfee's acquisition of Saber in August [CW, Aug. 7].

Meanwhile, Tally Systems Corp. in Hanover, N.H., upgraded its Cenergy desktop asset management suite for Microsoft Corp.'s Windows 95 and NT.

Keeping pace

The suites match the increased need of corporate users to address the cost of distributed computing, said Christopher Germann, an analyst at Gartner Group, Inc. in Stamford, Conn.

"As corporate users find the cost of ownership includes soft costs, such as distribution, installation and training, LAN utility companies like McAfee and Tally are offering more sophisticated functionality in these areas," Germann said.

Users of both companies' products applauded the move to higher integration.

"I like integrated products that work together instead of point solutions that don't work together," said Tracy Adams, manager of computer and technical services at Central Vermont Public Service Corp. in Rutland, Vt. The company uses Tally Cenergy. "The integration of all three products in Cenergy adds value because there's a single interface to get to data in all products."

Adams said Tally's move to integrate its software with WinInstall, a utility from OnDemand Software, Inc. in Naples, Fla., was "great" for the company. Central Vermont Public Service had been using the two products separately and now has to make only one telephone call for support.

A McAfee and Saber user said he, too, prefers the assimilation of products in a suite. "When McAfee bought Saber, we had site licenses with both vendors. Now we have to go to only one supplier for support," said Steve Nitenson, a principal network analyst at National Semiconductor Corp. in Santa Clara, Calif.

The products in the Saber LAN Workstation 5.5 suite aren't integrated under a common graphical user interface (GUI), but McAfee has promised that in the next release.

"We don't mind waiting up to two months past their commit date for the common GUI, but we don't want to wait longer than that," Nitenson said. "Then we would have a problem because it would impact our own rollouts." He said if McAfee slipped, he would consider other products.

McAfee will introduce the next version of its suite, Saber LAN Workstation 6.0, in February, said Liz Bross, product manager of McAfee's Saber LAN Workstation.

Suite sample

McAfee and Tally Systems have released product suites to help IS managers gain control of distributed hardware and software

McAfee Associates

The Saber LAN Workstation 5.5 suite includes four Windows applications:

- **SiteMeter 5.1** – Enterprise metering
- **SiteExpress 3.0** – Software distribution
- **ServerStor** – Workgroup backup
- **NetRemote 6.0** – Remote network management

Tally Systems

The Cenergy suite contains three applications for Microsoft's Windows 95 and NT:

- **NetCensus 2.8** – PC software and hardware inventory
- **CentaMeter 2.5** – License management and metering
- **WinInstall 5.1** – Software distribution for networks

Briefs

Bring in the Multia

Digital Equipment Corp. has announced the availability of its multiclient desktop, the Multia MI, which is equipped with a 100-MHz Pentium microprocessor from Intel Corp. Another model of Multia was introduced in January with Digital's Alpha processor. That model can access legacy, Unix and PC applications from one box running Microsoft Corp.'s Windows NT.

Oracle7 pairs up

Oracle Corp. and **Consilium, Inc.**, a Mountain View, Calif., maker of manufacturing execution systems software, plan to integrate their applications for the semiconductor manufacturing industry. Consilium's software will be combined with Oracle's Oracle7 database and client/server financial, manufacturing and distribution applications.

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IBM under the hood

Microkernel eases development of software for different operating systems

By Lisa Picarille

IBM's Microkernel may make it easier for information systems managers to implement and maintain applications that run across multiple system architectures.

During the next few years, hardware and software products built around the technology will make their way to users' offices and homes.

But customers probably won't know they are based on technology from IBM.

The IBM Microkernel is a core set of common functions and tasks — including memory and thread management, interprocess communications and I/O support — on top of which an operating system runs. The product has been under development for several years and is now commercially available.

Multiplatform support

The Microkernel lets hardware and software developers create a variety of products that can use the same core engine but have different operating systems. That helps maintain consistency across product platforms. Such products could include personal digital assistants, set-top boxes, desktop PCs and workstations.

Writing directly to the Microkernel will mean less work for software developers when porting their applications to another platform, said Michael Hahl, a senior planner at IBM Microkernel Business Development in Boca Raton, Fla.

"The Microkernel expands the possibility that software will be scalable and available on a variety of platforms," said Eric Johnston, LAN administrator at Mazda Motor Corporation of America in Irvine, Calif. Mazda has more than 20 servers and 50 clients that run OS/2. "The Microkernel architecture addresses the new issues of scalability, reliability, video, audio and bandwidth, and hopefully stops the stranglehold of Intel-dominated software."

The benefits of the Microkernel technology are twofold for IBM. First, it plans to use the technology as the foundation for its entire line of operating systems, including OS/2, MVS and OS/400. This will give the company more flexibility, scalability and modularity in its product line, Hahl said. The first IBM product to use the IBM Microkernel Release 1.0 will be the long overdue OS/2 for the PowerPC, which will ship in January after a nine-month delay.

"It doesn't exactly bode well for IBM that they had to delay the RISC version of OS/2 twice to make it work with the Microkernel. It might mean that using this isn't as easy as IBM is making it out to be," said David Card, an analyst at International Data Corp. in Mountain View, Calif.

A moneymaker, too

The second advantage for IBM is the steady income that licensing the technology to developers is expected to generate, said Amy Wohl, editor of "Trends Letter," a newsletter in Narbarth, Pa.

Wohl said the Microkernel is a good idea. "This is an outgrowth of what Taligent was supposed to do — run multiple operating-system personalities on top. But that never happened," she said.

But she said it was unlikely everyone would write to the Microkernel. "Desktop applications are not going to have much use for this," Wohl said. "And even though Microsoft [Windows] NT could be ported to run on top of the Microkernel, Microsoft is not going to say that everyone should now write to the IBM Microkernel API."

Microkernels popping up

Several commercial vendors have signed OEM agreements to license the IBM Microkernel

COMPANY	EXPECTED PRODUCTS BASED ON IBM MICROKERNEL
Digital (U.S)	Embedded solutions for desktop systems on Alpha, Intel and PowerPC processors
LG Electronics (Goldstar) (Korea)	PDAs, set-top boxes, multimedia and consumer products
Komatsu (Japan)	Factory automation programs for the PowerPC
Trusted Information Systems (U.S.)	Security systems for DOS, Windows and Unix
Institute for Information Industry (Republic of China)	PDAs, set-top box software on Intel, PowerPC and Mips Technologies platforms

ThinkPads priced to chase Toshiba

By Mindy Blodgett

Taking direct aim at the market dominance of Toshiba America Information Systems, Inc., the IBM PC Co. has announced low-end ThinkPads with many high-end features.

The ThinkPad 365 notebook series will cost from $1,999 to $3,099. IBM officials said the series will start at about $1,999 for a model with a DX4 processor, a 540M-byte hard drive and 8M bytes of RAM. IBM officials said they are going after average business users with this line.

IBM's announcement comes just as Toshiba finally set prices for its most recently announced line, the Satellite family.

These low-end DX4-based notebooks will cost $1,699 for a model with a 330M-byte hard drive and $2,499 for a model with a 500M-byte hard drive.

Multimedia-equipped

The ThinkPad 365s are multimedia laptops that feature 75-MHz DX4 processors. They also feature many attributes of the more expensive models, including CD-ROM drives, wireless infrared printing and file swapping. Company officials said the line eventually will offer Intel Corp. Pentium processors.

Analysts say the notebook line is a sign that IBM has changed its focus from being the technology leader to being a pragmatic vendor that aims its products squarely at business budgets.

The line will join the mid-range ThinkPad 755s, which cost about $5,400, and the premium 760s, which are aimed at the executive-level market and cost about $7,400.

"IBM is saying they are ready to do battle," said Kimball Brown, an analyst at Dataquest, Inc. in San Jose, Calif.

"Rather than differentiating themselves with superior technology, they are lowering prices as well."

The ThinkPad 365s will weigh between 5.8 pounds and 6.4 pounds and will give users a choice of operating systems, including OS/2 Warp or Microsoft Corp.'s Windows 95. Docking stations won't be included, but the line will offer port replicators, or pared-down docking stations.

Notebooks

Industry observers said the line's pricing will get attention. But whether IBM's strategy will eat into Toshiba's dominance is another question.

Randal Giusto, an analyst at International Data Corp. in Framingham, Mass., said the pricing "is definitely very aggressive for a new product line."

But marketing will be the key in the next few months, he added.

"There are just so many new notebook announcements out there," he said. "What will be important will be what IBM is doing with channels. How will they compete for shelf space?"

But these new notebooks definitely give users value for their money, Giusto said. "This is IBM's shot across Toshiba's bow," he said.

IBM's ThinkPad 365 features the following:

- 75-MHz DX4 processor
- 10.4-in. thin film transistor active-matrix screen or dual-scan, passive-matrix screen, depending on model
- Slots for two Type I/II PC Cards or one Type III card
- Built-in CD-ROM drive (with high-end models)
- Optional port replicator with palm rest

Customizing tool to be sold in Europe

IBM plans to sell the OS/2 version of the WitchDesk operating system add-on in Europe. WitchDesk lets users customize their desktops, according to company officials.

WitchDesk, developed for OS/2 and Microsoft Corp.'s Windows 95, will make its official debut this month at Comdex/Fall '95 in Las Vegas.

It will be packaged with more than 1,500 photos and images, which can be added to Windows 95 or OS/2 desktops.

Users also may import their own photographs by scanning them in. IBM hopes the application will make OS/2 more attractive.

The add-on will be further developed and distributed by WitchDesk, Inc. in San Jose, Calif. That is a joint venture company founded last month by Swiss programmer Hannes Keller, the developer of WitchDesk, and German PC maker Vobis Microcomputer AG.

Vobis will bundle WitchDesk, which eventually will be sold in various languages, with all of its Windows 95- and OS/2-based PCs sold through its retail network.

German and English versions of WitchDesk are expected to ship in December and are priced at $70, Vobis said.

— Torsten Busse, IDG News Service, Munich

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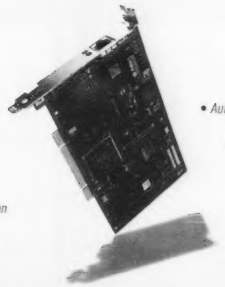

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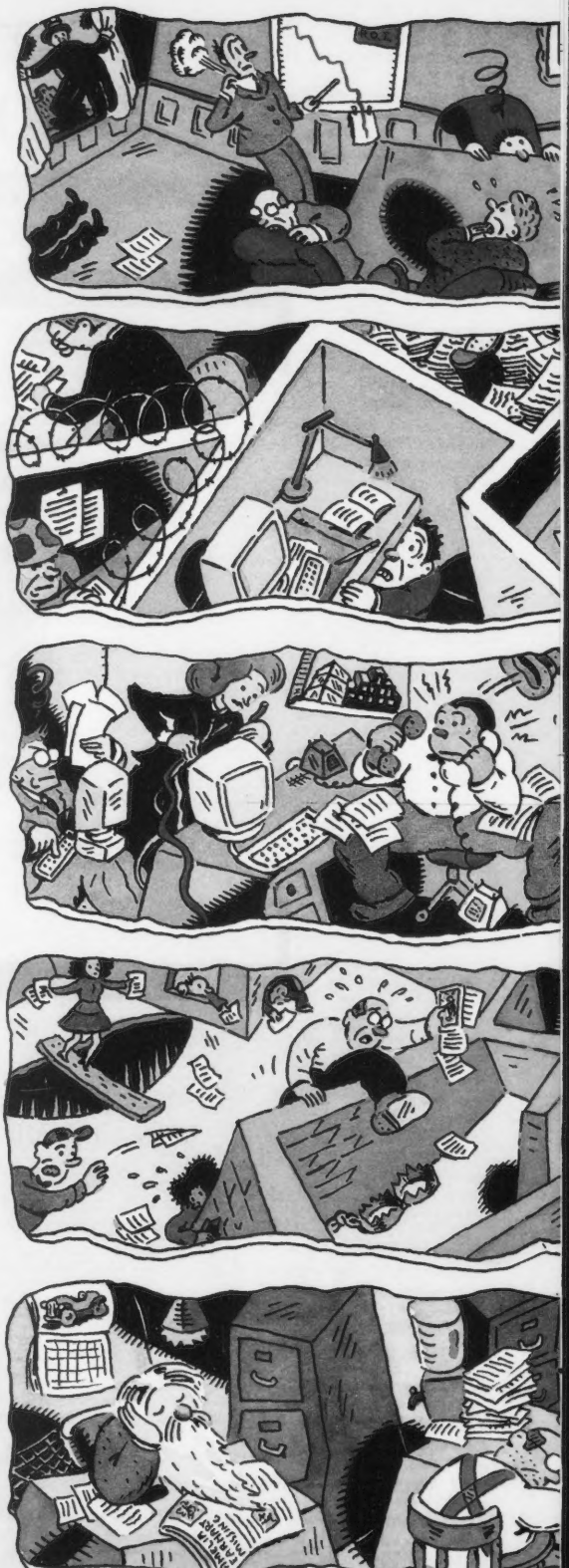

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New Products

Nview Corp. has announced Diamond D-400, a computer projection product.

The Newport News, Va., company said Diamond D-400 is a portable presentation projector that uses Digital Light Processing technology in a self-contained projector design for delivering computer or video presentations in a normally lit room.

Diamond D-400 connects up to four input sources (two computer and two video) for multimedia presentations and uses a reversible cable that is compatible with Macintosh and PC-based systems. It has two speakers and input ports for attaching external speakers.

Diamond D-400 costs $9,495.

▶ *Nview*
(804) 873-1354

Network Music, Inc. has introduced Presentation Audio, a CD-ROM music library.

According to the San Diego company, Presentation Audio is a CD-ROM music library for users of presentation software. It lets users add professional-quality, fully orchestrated music and sound effects to computer-based presentations. Each volume of the five-CD library contains 30 music "beds" edited in 60-second, 30-second, short tag and loop versions along with more than 100 sound effects. Other production elements include zaps, lasers, drones and sweepers.

The library includes a utility that lets users export sound files as stereo or mono, 22- or 11-KHz and 16- or 8-bit files. It can be used directly from the CD-ROM drive or installed on the user's hard drive.

Presentation Audio costs $50 per volume. The five-CD set costs $200.

▶ *Network Music*
(619) 451-6400

Leading Market Technologies, Inc. has released Expo/Advanced Technical Analysis, a decision-support worksheet.

The Cambridge, Mass., company said Expo/Advanced Technical Analysis lets users rapidly display, analyze and manage financial data. It can connect to any data feed or database and contains a range of decision-making aids, including preconfigured studios, functions and indicators.

Expo/Advanced Technical Analysis is fully customizable and lets users add proprietary functions and design their own menus. It includes a macro language for creating custom functions and studies. With Dynamic Link Libraries, it can bind C language functions directly into the product.

Single copies cost $1,995 for the Windows version and $3,995 for the Unix version.

▶ *Leading Market Technologies*
(617) 494-4747

CTX International, Inc. has introduced the EzBook 5x86 series notebook computer.

According to the Walnut, Calif., company, the EzBook 5x86 has a 10.4-in. active-matrix color screen that supports 640- by 480-pixel resolution. When connected to an external monitor, the EzBook 5x86 supports a maximum resolution of 1,024 by 768 pixels at 256 colors. It has write-back cache support, 8M bytes of RAM and an 810M-byte hard drive.

CTX International's EzBook 5x86

The EzBook 5x86 has a side-out hard drive that lets users with multiple hard drives change from one drive to another. It also has a built-in Sound Blaster Pro-compatible 16-bit stereo sound card with a built-in speaker and microphone, 3½-in., 1.44M-byte internal floppy disk drive and two PCMCIA slots. It comes with Microsoft Corp.'s Windows 95.

Pricing for the EzBook 5x86 starts at $2,699.

▶ *CTX International*
(909) 598-8094

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Answers on Demand.

NMB Technologies, Inc. has introduced the Right Touch ConcertMaster Multimedia Keyboard.

The Chatsworth, Calif., company said the keyboard has built-in speakers that feature SRS Labs, Inc.'s SRS 3-D stereo surround sound. It has a built-in microphone and includes all sound and audio controls, including on/off, volume and mute.

The multimedia keyboard includes three side jacks for headphones, microphones and subwoofer and lets users plug any audio device, including external speakers, in to the keyboard. It is compatible with all sound cards and portable audio devices, and it features an integrated shielded speaker system with a two-plus-two watt amplifier. It also includes three keys that allow quick access to Microsoft Corp.'s Windows 95.

The Right Touch ConcertMaster Multimedia Keyboard costs $190.

▶ *NMB Technologies*
(818) 341-3355

Hewlett-Packard Co. has rolled out the ScanJet 4 series, a family of scanners.

The line includes the ScanJet 4s, a gray-scale personal desktop scanner, and the ScanJet 4c, a color scanner. Both scanners work on Microsoft Corp.'s Windows 95.

The Palo Alto, Calif., company said the ScanJet 4s automatically activates when paper is inserted. It includes AutoLaunch software, which can move documents into more than 75 different applications, including PC fax, electronic mail and word processors. It scans a typical page in less than 10 seconds.

The ScanJet 4c is a high-quality desktop color scanner with optical resolution of 600 dot/in. and enhanced optical resolution of 2,400 dot/in. It was designed to let users scan high-quality images and text into applications and distribute and share paper-based information electronically. It ships with the following image-scanning software: Corel Systems Corp.'s Photo-Paint for PC users or Adobe Systems, Inc.'s Photoshop LE for Macintosh users. It also comes with Caere Corp.'s OmniPage Limited Edition optical character recognition software.

The ScanJet 4s costs $349, and the ScanJet 4c costs $995.

▶ *Hewlett-Packard*
(415) 857-1501

Sejin America, Inc. has introduced the SPR-8630WP Wireless Keyboard.

According to the Santa Clara, Calif., company, the SPR-8630WP Wireless Keyboard can be used up to 20 feet away for more than 900 continuous hours on two AAA batteries. An infrared receiver connects to the keyboard port on the PC.

The SPR-8630WP Wireless Keyboard is a notebook-size keyboard with full-size keys. It costs $100.

▶ *Sejin America*
(408) 980-7550

Pioneer New Media Technologies, Inc. has bundled the DR-U124X CD-ROM drive and DRM-624X CD-ROM changer.

According to the Long Beach, Calif., company, the DR-U124X CD-ROM drive is an internal, half-height CD-ROM reader. It features a 4.4G-byte high-speed drive and has a data transfer rate of 676K bit/sec.

The DRM-624X CD-ROM changer is a six-disc changer with a 4.4G-byte high-speed drive. It features Pioneer's six-disc magazine, which gives users near on-line access to a multidisc database without manual disc switching or special command routines. It can change discs in less than five seconds and supports all major CD standards and formats.

Pricing for the bundle starts at $229.

▶ *Pioneer New Media Technologies*
(310) 952-2111

Product short

Intellicomp Technologies, Inc. has introduced P-5 Triton Super Server, a desktop system series. The servers ship with a 1.2G-byte hard drive, 16M bytes of RAM, a six-speed CD-ROM drive, a video accelerator with 2M bytes of virtual RAM, a 1.44M-byte floppy drive, a Sound Blaster Stereo sound card, speakers and a 28.8K bit/sec. voice fax modem. Systems are available in Intel Corp. 133-, 120- and 100-MHz Pentium configurations. Cost: starts at $2,498. Intellicomp Technologies, El Monte, Calif. (818) 582-8096.

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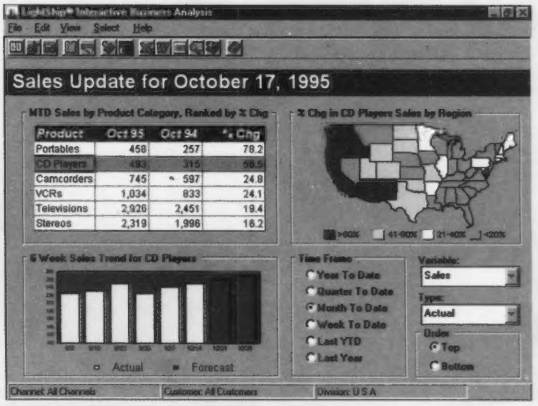

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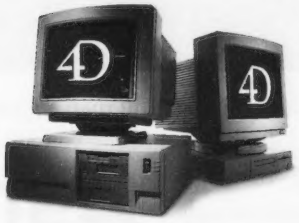

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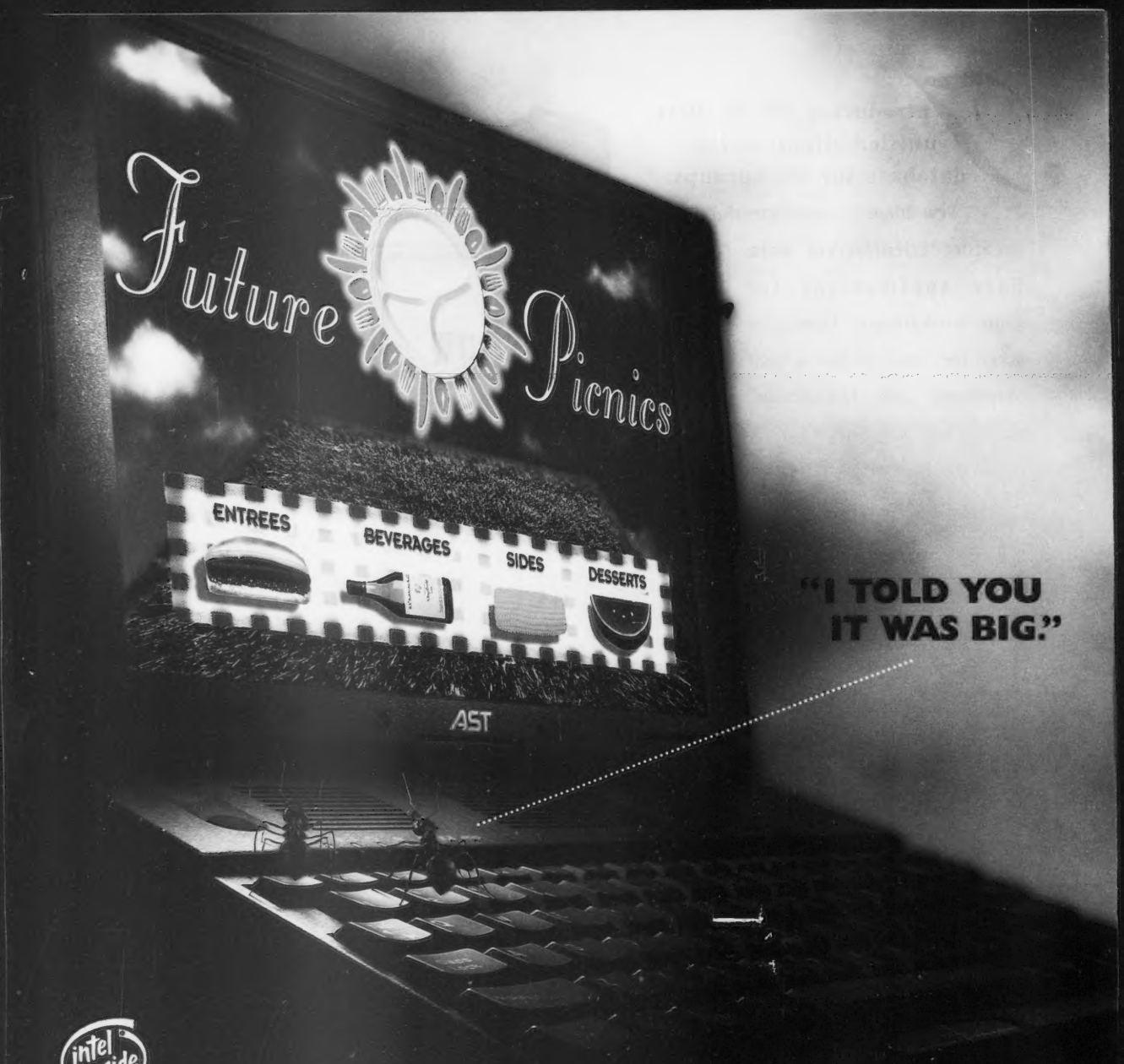

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pentium

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Database daring

Microsoft begins bold bid to make SQL Server an enterprisewide player

By Dan Richman

The first audited benchmark results for Microsoft Corp.'s SQL Server 6.0, released last month, signal the vendor's bid to enter a highly competitive arena dominated by long-established Unix-based relational database management system vendors.

Benchmarks are just numbers, which some observers say can be tampered with and are no substitute for thorough in-house trials. But Microsoft's entry into the benchmarking race indicates its intent to move SQL Server from the departmental level to the enterprisewide level in large companies.

Some say SQL Server 6.0 doesn't have the stuff to compete with Oracle Corp., Informix Corp. and Sybase, Inc. for enterprisewide, mission-critical installations. Detractors point to SQL Server's availability only on Windows NT; its limited scalability, both upward and downward; its inability to handle a wide range of data types; and its lack of cutting-edge features.

But the Redmond, Wash., company intends to try. "We do see going up against Unix. We're betting the farm on Windows NT, SQL Server and the other elements in BackOffice," said Dan Basica, SQL Server product manager. BackOffice is a suite containing the operating system, the RDBMS, a mainframe connectivity package, systems management software and an electronic-mail server.

Large corporations such as United Airlines, Pennzoil Co. and Blockbuster Entertainment Corp. have built significant applications with SQL Server. Of 150 Fortune 1,000 attendees at a Gartner Group, Inc. conference this summer, more than half said they would use SQL Server by 1997.

Getting the job done

Several users said they are pleased with SQL Server, even in crucial applications.

"We've had SQL Server running at 14 sites, supporting 1,000 clients at an average of 18 transactions per second for two years, with very satisfactory performance," said David Greenberg, chief technical officer at Visteon, Inc. in Maitland, Fla. Visteon administers the DBMS at the Orlando Healthcare Group, a medical group practice in Florida.

As to the most frequently heard criticism — lack of upward scalability — advocates say they are content that NT is available for Intel Corp.'s chips, Digital Equipment Corp.'s Alpha chips and Mips Technologies, Inc.'s chips. PowerPC support is promised in 1996.

"The only problem we've had is with scaling, and with NT on RISC chips, we feel we have enough headroom," said Guy Brown, database administrator at A. E. Staley, a corn products manufacturer in Decatur, Ill. He said there has even been talk of replacing IBM's mainframe DB2 and Oracle with SQL Server.

Users praised SQL Server's graphical administration tools, its relative simplicity and — an anathema to supporters of open systems — its unity of DBMS vendor and operating system vendor. "The pundits may be scared of hegemony, but it's a good deal for users," Greenberg said.

Microsoft is moving to increase its appeal to information systems types. Last month, it bought Netwise, Inc., which will provide additional mainframe connectivity through its TransAccess product.

Basica said the next version of SQL Server, code-named Hydra and due out sometime in 1996, will include Simple Network Managment Protocol alerts and replication to non-Microsoft DBMSs, among other enterprise-oriented features.

Where will this lead? Oracle President Ray Lane has been quoted in reports as saying that in five years, Microsoft will be the No. 2 company in the RDBMS market, behind his own.

The pros and cons of Microsoft's SQL Server

Pros	Cons
• Windows NT is available on multiple chip sets	• Runs only on Windows NT
• Best price/performance	• Scales to maximum of eight Intel processors
• Easily administered with graphical tools	• Few leading-edge features
• Unified DBMS and operating system	• Largest installed database is 110G bytes

Source: Industry experts

Smaller banks hand data gems to third party

By Thomas Hoffman

Data warehousing is a no-brainer if you're a Bank of America or a Citibank. These banks — flush with multimillion-dollar information technology budgets — have assembled terabyte-size data repositories.

But for smaller and medium-size banks with more modest information technology resources, full-blown data mining initiatives have been too expensive to cost-justify. With survival at stake in the merger-mad banking world, some smaller banks are looking to outside services that can build and help manage their data warehouses faster and cheaper than the banks can themselves.

Data warehousing

Data warehousing has become one of the banking industry's hottest technology trends. Bankers are betting on it to help them identify and market products to their profitable clients.

One example is D&N Bank, a $1.1 billion bank in Hancock, Mich., with 33 branches. In May, D&N began using M&I Data Services' Information Desktop data warehousing service. The bank outsourced the core processing of its deposit accounts, commercial loans and mortgage loans to the Brown Deer, Wis., service bureau in 1993.

Previously, D&N's data mining efforts had been "rudimentary," according to Tom Burns, the bank's senior vice president of operations. The bank had used a fourth-generation language to allow users or bank programmers to write reports against the company's mainframe database. Data was extracted from spreadsheets or PC databases using Personics Corp.'s Monarch tool.

With the outsourcing arrangement, M&I now collates

Warehouses, *page 60*

Imaging goes eclectic

Component approach trims costs and broadens options

By Tim Ouellette

Closer Look IMAGING

Not too long ago, any imaging system would have sent information systems costs for Rockwell International Corp.'s Rocketdyne Division's space station project soaring to the moon.

That is because users could buy only large, proprietary, fully integrated imaging systems with high price tags. But the space station project wanted only to store images in one department and not burden the whole company with a new application.

So Ashok Kohli, Rocketdyne's manager of data management, installed Kofax Image Products' Ascent Capture, software that works out of the box to handle the image capture portion of traditional imaging systems.

Since then, Kohli's group in Canoga Park, Calif., has converted 3 million paper documents into electronic files, which are stored on a CD-ROM jukebox and can be accessed by workers.

Imaging software helps convert paper documents into electronic files that can be viewed, marked up and archived on optical storage.

"We are eventually going to look at a division-wide system," Kohli said.

Imaging, *page 56*

Imaging puzzle

Component imaging is broken into two levels:

Component applications: Shrink-wrapped packages include image capture, image viewing, storage, workflow or document management. **Price range:** $1,000 to $10,000

Component tool kits: Usually for image capture and image viewing, these kits provide separate custom controls to add scanning, optical character recogni-tion, annotation and image cleanup to applications. **Price range:** $150 to $2,000

PCAnywhere gets 32-bit upgrade

By Mindy Blodgett

Symantec Corp. in Cupertino, Calif., has upgraded its popular Norton PCAnywhere remote communications software for users of Microsoft Corp.'s Windows 95 and Windows NT.

PCAnywhere 32 offers remote control, file transfer and connectivity across the two operating systems.

By taking advantage of the 32-bit architecture of Windows 95 and NT, PCAnywhere 32 offers faster session and file transfer speeds, which saves users money, according to Symantec officials.

Robert Beck, president of Beck Associates, a consultancy in Oklahoma City, uses PCAnywhere to remotely diagnose system problems. Beck said many of his clients are small businesses.

The speedier connections make it easier to assess remote problems, he added.

"This version works with the older 16-bit version, as well, which is helpful for many of my small-business clients who haven't yet gone to Windows 95," Beck said.

Elisabeth Rainge, an analyst at International Data Corp. in Framingham, Mass., said mobile users will find the latest version easier to configure than former versions.

The software will be available later this month for $149.95.

What's inside

Features of the enhanced PCAnywhere include the following:

- Support for Microsoft's Windows 95 and NT.
- Support for DOS and Windows, including Microsoft's Windows 3.x.
- An antivirus feature that automatically checks files.
- ColorScale TM, an option that allows users to select higher screen refresh speeds while reducing color resolution as a way to speed up transmission. There is also an option that transfers only the parts of the files that have changed.

—Mindy Blodgett

Briefs

Unisys launches remittance system

Unisys Corp. has developed an image-based remittance system designed specifically for the communications industry. **US West Communications, Inc.** codeveloped the $7.2 million system as part of its re-engineering effort, but Unisys will resell the system to other communications providers. The system will address the high volume of payments and the mixture of payment types in the communications industry.

Minolta upgrades its image

Minolta Corp.'s Business Products Group announced an upgrade to its imaging and workflow system, MIMS 3000 Plus, at Imaging Expo in New York.

Auspex adds NFS servers

Auspex Systems, Inc. in Santa Clara, Calif., has added high- and low-end models to its line of Network File System (NFS) file servers. The NS7000/650, priced from $110,000, can support up to 800 Unix or PC users, the company said. The low-end $39,900 Model 150 server was designed for workgroups of 20 to 50 users.

Legato to ship NT storage software

Legato Systems, Inc. in Palo Alto, Calif., has introduced storage management software that runs natively on Microsoft Corp.'s Windows NT Server. NetWorker for Windows NT supports stand-alone NT workgroups and mixed environments in which an NT-based system is configured as a storage management server. Shipments start this quarter.

Imaging

CONTINUED FROM PAGE 55

"But right now, Ascent Capture, along with a ZyLAB International, Inc. image management component, is doing the job for us."

Component imaging promises companies an inexpensive and easy starting point for imaging. Users can buy different pieces of an imaging system from different vendors, customizing those pieces and adding what they need along the way.

With the growth in popularity of Microsoft Corp.'s Visual Basic and other visual development environments, analysts said, component imaging is taking its first bites of the estimated $3 billion imaging market. While component imaging is still in its early stages, some analysts said it is the way to go.

"Generally speaking, you have to be insane to go the monolithic route," said Steve Weissman, president of Kinetic Information, a consultancy in Waltham, Mass. "Your business is going to change in the next couple of years. [Monolithic systems] don't take into account the need to tweak and grow over time."

One way or another

There are basically two types of component approaches. One provides a shrink-wrapped package that performs several integrated functions, such as scanning, optical character recognition and indexing out of the box (see chart, page 55). The other goes to the programming level, providing tool kits that let developers add specific imaging functions to corporate applications by using Visual Basic or Powersoft Corp.'s PowerBuilder.

Today, even with client/server architectures removing much of the proprietary nature of imaging software, large-scale imaging systems are still common. Most installations by traditional imaging vendors FileNet Corp. and IBM are still focused on expensive and complex installations that often cost hundreds of thousands of dollars. But even FileNet, Wang Laboratories, Inc. and ViewStar Corp. have begun offering component-based imaging software [CW, July 10].

"Before component imaging, the only applications we had were very large applications in very large companies," said George Weihs, president of Synergetix Systems, Inc., an imaging integrator in Westbury, N.Y. "Since then, component imaging has allowed departmental imaging systems at smaller locations and a relatively low cost."

For example, when Leaseline Financial, Inc.'s imaging integrator went bankrupt, one programmer at the Birmingham, Mich., auto leasing firm was able to use Diamond Head Software, Inc.'s ImageBasic tool kit to program the system himself, said Tony Greening, a financial assistance specialist who helped on the project. The imaging system took five months to get up and running and included an interface, scanning, indexing, retrieval, bar code recognition and access to a Novell, Inc. NetWare LAN.

Conventional large-scale imaging systems often take much longer to develop and test than do their componentized brethren, and they require a battery of integration consultants. But users shouldn't look at component imaging as the easy way out because analysts and vendors say there is more to the equation.

"When you pay thousands for a FileNet system, you are really buying an integrated back end" because the front end isn't usually very intuitive, and the back end is very robust, said Bruce Silver, principal at Bruce Silver Associates, a consultancy in Weston, Mass.

On the other hand, components create excellent front ends but need better back-end support. Diamond Head tried to address this recently by adding support for an array of optical and CD-ROM jukeboxes to its imaging software.

Small part

Imaging tool kits, with their Microsoft Visual Basic controls or OLE custom controls, obviously require some customization on the user's part. But even integrated component software that provides several features in one box — such as Ascent Capture or Cornerstone Imaging, Inc.'s InpuAccel — requires programming skills to properly integrate its functions with other products.

"Components only address a small piece of the problem for an imaging system," said Kevin Drum, vice president of marketing at Kofax in Irvine, Calif. "You still have to deal with database integration, administration and setup programs, too."

High tech goes to camp

When you have to process 7,000 camp counselor applications and distribute them to summer camps around the country each spring, you don't want to depend on a copy machine as your only imaging technology.

That was the problem the American Institute of Foreign Study (AIFS) in Greenwich, Conn., faced when it decided to turn to an imaging system. The system had to integrate with an existing Oracle Corp. database and VAX applications, run on a Novell network and incorporate photos attached to each counselor application, said Tom Whitehouse, AIFS' chief information officer.

Picture perfect

Without any Windows programming experience, the company first looked at shrink-wrapped packages and imaging integrators.

"We have a small shop," said Jeanne Pollack, director of information services. "We can't know everything about every language."

Ultimately, the institute turned to project integrator Synergetix Systems. The system was developed using Diamond Head Software's ImageBasic, a set of imaging custom controls for Microsoft's Visual Basic, along with a storage subsystem from LaserData, Inc. and custom controls to help with emulation of the VAX applications.

AIFS workers can view a digitized version of a camp counselor's application in one window while seeing the picture in another, Pollack said. And if a camp director is interested in someone for a counseling position, the form can be printed and mailed or faxed immediately for a same-day decision. That process used to take 10 days.

— Tim Ouellette

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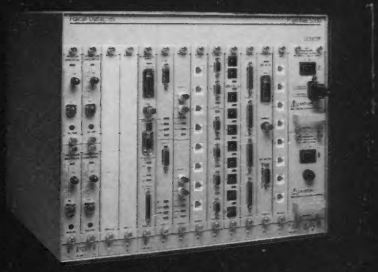

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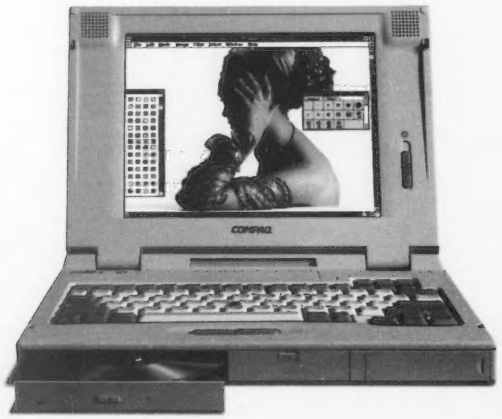

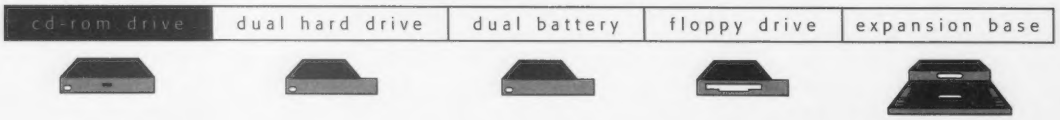

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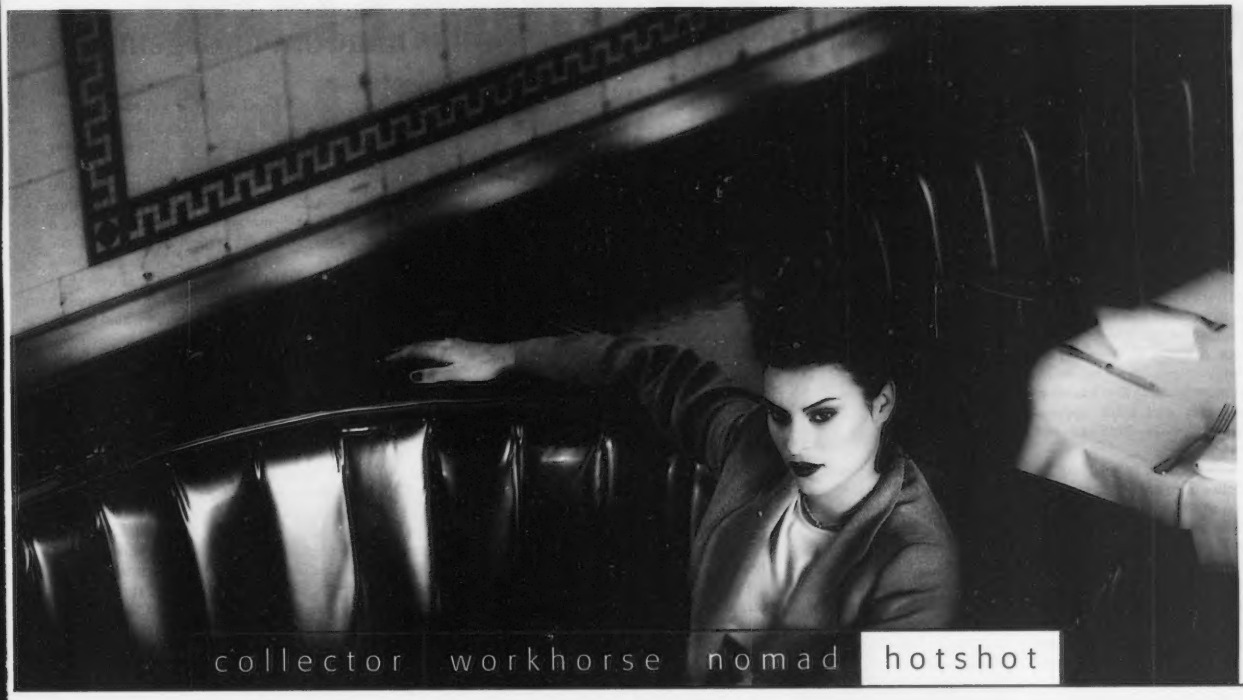

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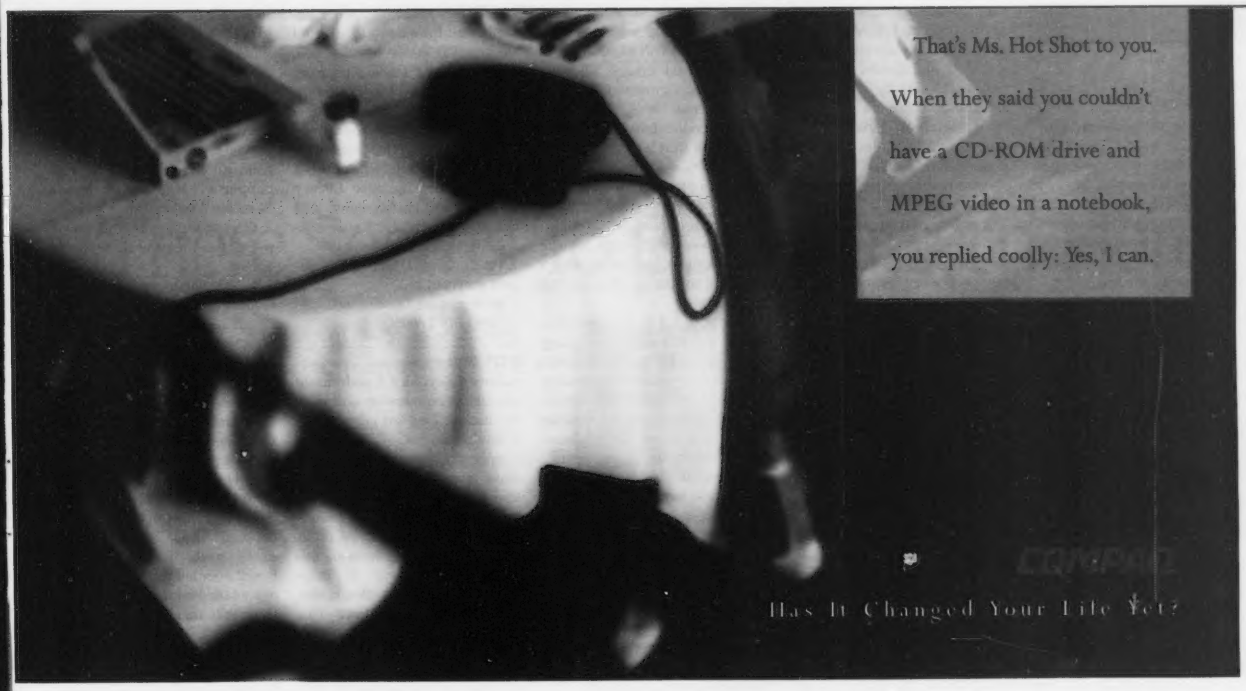

That's Ms. Hot Shot to you. When they said you couldn't have a CD-ROM drive and MPEG video in a notebook, you replied coolly: Yes, I can.

Has It Changed Your Life Yet?

Novell begins Win 95 move

Free software gives Microsoft users access to NetWare

By Bob Wallace

Novell, Inc. has delivered an eagerly anticipated beta version of client software that lets Microsoft Corp. Windows 95 users access all NetWare services.

The 32-bit software, called NetWare Client 32 for Windows 95, is a month late but can now be downloaded free of charge from Novell's NetWire. It includes NetWare Application Manager, a utility that lets users centralize and track application usage in NetWare networks.

Novell said it is readying 32-bit clients for operating systems such as DOS, Windows 3.x and Apple Computer, Inc.'s Macintosh, but it did not say when they will be available.

On the way

Some Novell users plan to use the new software as they move to Windows 95 in the not-too-distant future.

"We're looking for this to unify an awful lot of clients we have out there today," said John Dubiel, planning manager at Boston Edison Co. "Novell shops have been looking for a client that's network-aware and intelligent. It's a good product, and we look forward to it."

Boston Edison's sprawling network comprises about 3,000 nodes and 100 file servers. "Most of the clients we have now are Windows 3.1, and we're looking at moving to Windows 95 in 1996," Dubiel said.

Open Windows

According to Novell, NetWare Client 32 for Windows 95 enables users to do the following:

- Access all NetWare services and resources through NDS from Windows 95.
- Take advantage of long file name conventions and store the files on NetWare servers.
- Connect to NetWare 2.x, 3.x and 4.x networks using a graphical log-in procedure.
- Implement network security through packet signature and secure password authentication.

The beta version of the new software was supposed to have shipped about a month ago. A Novell spokeswoman said that date was pushed back "to make sure we had a good, reliable product." The company already has plans to update the beta software. The final version of NetWare Client 32 for Windows 95 is tentatively set to ship free to NetWare users in the first quarter of 1996.

Users can customize Client 32 through the Windows 95 Registry to optimize performance and enable security.

Novell said users can access Novell's NetWare file and print resources through the Windows 95 Network Neighborhood and Explorer interfaces.

Because network administrators can deploy network applications, assign them by user and store the data on NetWare Directory Services (NDS), Windows users will have consistent access to applications from anywhere on a network, according to Novell.

Banks hand out data gems

CONTINUED FROM PAGE 55

D&N Bank's transactions each night and downloads the data into its data warehouse, where D&N staffers can dial in and launch queries against the data using Information Builders, Inc.'s PC/Focus tools. As a result, users can generate reports themselves and no longer have to rely on programmers.

"It has made the service bureau environment more akin to having an in-house data center," Burns said.

Quick turn

M&I's third-party data warehouse has also been an asset for Intrust Bank N.A., a $1.5 billion institution in Wichita, Kan. The bank outsourced its data assets to M&I last August. Intrust is getting faster turnaround on its data queries under the M&I-managed data warehouse than it once did using Cobol-based reporting tools against its legacy applications.

For example, Intrust's president recently asked Chief Information Officer Steve Hipp for a breakdown of the bank's customers with more than $50,000 in deposits and without an officer assigned to them. Using an Intel Corp. Pentium workstation, Hipp launched a set of queries against M&I's data warehouse, gathered the information and delivered a report on the president's desk within 30 minutes.

"In the previous world, if it was declared a crisis, two or three days would have been considered good turnaround on that report," Hipp added.

Looking ahead

D&N Bank's data warehousing users use dial-up connections from an IBM SNA 9600 BAUD network to access transaction data stored in M&I's data repository. To increase the bandwidth between its 33 branches and the M&I data center in Brown Deer, Wis., D&N plans to decide on a TCP/IP or other upgraded network infrastructure by spring 1996, according to Tom Burns, the bank's senior vice president of operations.

New Products

U.S. Robotics, Inc. has unveiled Iworks conference, a full-duplex conference speakerphone.

According to the Skokie, Ill., company, Iworks conference incorporates full-duplex (users at both ends of the line can talk at the same time) with automatic gain control that maintains high sound quality while people move around the room.

Iworks conference also includes an adapting feature that adjusts the unit to room acoustics, an answering function that lets users answer calls by pressing any key on the phone, an integrated keypad, mute keys, status lights and three built-in microphones. It is available in two versions: a basic kit and a kit that includes extension microphones for large conference tables.

Pricing for Iworks conference starts at $399.

▶ *U.S. Robotics*
(708) 982-5010

Digital Tools, Inc. has introduced AutoPlan II 3.0, a project management product for workgroups.

According to the Cupertino, Calif., company, AutoPlan II 3.0 allows projects to be distributed geographically across an organization and linked electronically at the activity level. Project information can be organized by department, division or enterprise. It includes resource pools that let managers balance shared resources across multiple projects.

AutoPlan II 3.0 features automatic triggers that notify team members and managers when key events or thresholds occur. Triggers can send messages to the AutoPlan Inter-Project Bulletin Board system and directly to the Internet for electronic-mail distribution. The product also includes spreadsheet interfaces, a custom report writer and shared layouts for charts and reports. It also gives users the ability to attach multimedia objects (video and sound clips) to projects.

AutoPlan II 3.0 costs $1,495. A shared license costs $2,995.

▶ *Digital Tools*
(408) 366-6920

Merex Corp. has introduced MerexEdit 1.5, network document editing software.

According to the Tempe, Ariz., company, MerexEdit 1.5 automates the revision of work-related instruction documentation and procedures. It lets users share files off a LAN or WAN and off local drives, allowing various configurations for individual needs.

The product features a Check command that lets users select and process documents. It applies controlled vocabulary, writing rules and grammar to selected sections and automatically checks the style of the paragraph to determine which rule set to use to process the paragraph.

MerexEdit 1.5 includes features for document tracking and reporting, which let managers monitor editors for quality control. It has editor configuration options, which let managers assign different document types and skill levels to editors.

MerexEdit 1.5 is Windows-based and compatible with Microsoft Corp.'s Word and Novell, Inc.'s WordPerfect for Windows. Pricing starts at $15,000 for up to five stations.

▶ *Merex*
(602) 921-7077

Meridian Data, Inc. has unveiled CD Net for Macintosh, CD-ROM networking software.

According to the Scotts Valley, Calif., company, CD Net for Macintosh lets Macintosh workstations simultaneously locate and access CD-ROMs over Novell, Inc. networks. Once a user selects a disc, the software mounts the CD-ROM and performs any special setup required by the application.

CD Net for Macintosh features tailored security, disc library tracking and management and the ability to restrict access to specific CD collections.

Pricing for CD Net for Macintosh starts at $495.

▶ *Meridian Data*
(408) 438-3100

FTP Software, Inc. has announced Keypak 3.2, automatic document conversion software for mail-embedded client/server environments.

According to the Andover, Mass., company, Keypak 3.2 lets users of host computer and PC-based document processing systems exchange fully editable documents while preserving the original formatting. It integrates with popular electronic-mail systems and gateways to provide document conversion for the user.

Keypak 3.2 features Hypertext Markup Language (HTML) conversion capabilities that can convert .GIF images for addition to HTML documents. It lets users mail complete documents without the sender being concerned with the applications used by the recipients. It can detect the type of file that is to be converted and converts it at the server level without assistance from an administrator. It also supports Microsoft Corp.'s Word for Windows 95.

Pricing for Keypak 3.2 starts at $47 per user for a 25-user license.

▶ *FTP Software*
(508) 685-4000

Hewlett-Packard Co. has introduced the HP ScanJet 4SI network scanner for Novell, Inc. networked workgroups.

According to the Palo Alto, Calif., company, the HP Scan Jet 4SI is a gray-scale scanner with direct hardware LAN connectivity. It lets users on a Novell NetWare 3.1x network and above capture and electronically share and distribute paper-based documents. It also lets users scan documents and send them to team members via electronic mail.

Pricing for the ScanJet 4SI network scanner starts at $2,999 for a 20-seat user license.

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SENTRY SOFTWARE PUTS KABOSH ON CYBERPORN IN WORKPLACE, 66
LAN EMULATION SOFTWARE SURPRISES ATM USERS, 68

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On-line commerce must clear hurdles

By Gary H. Anthes

Electronic commerce promises huge benefits, but it faces equally large obstacles, according to a coalition of information technology users and vendors.

The Reston, Va.-based Cross-Industry Working Team recently released a report that lists a plethora of challenges to electronic commerce. Chief among them are that electronic commerce lacks security and interoperability and is difficult to use.

Nevertheless, the group cited estimates that within a decade there will be 17 billion internetwork-based transactions annually. That is about half the number of credit-card transactions this year.

But the report raises some questions that need to be answered before electronic commerce can really take off. It also outlines several commercial functions, such as negotiating, ordering, billing, paying and accounting, that need to be more fully implemented electronically.

The 22-page report doesn't try to answer the many questions it raises, although it does outline an "architecture" for electronic commerce that consists of a hierarchy of required services. "It's an inventory, not a program plan," said Charles N. Brownstein, executive director of the coalition and an employee at the Corporation for National Research Initiatives.

Internetworking

The Cross-Industry Working Team comprises 43 companies in banking, publishing, entertainment, telecommunications and computer software and hardware. They have joined to develop a common technical vision for the National Information Infrastructure (NII). Its latest report, "Electronic Commerce on the NII," is available on the Internet at http://www.cnri.reston.va.us/xiwt.

User outline

It does offer a useful checklist for users and vendors who want to exploit the Internet for commercial purposes, he added. "This lays out the vast amount of work that needs to be done to pull things together."

Dan Schutzer, a vice president and director of advanced technology at Citicorp, a coalition member, said the obstacles to electronic commerce are formidable but won't deter his company from proceeding with electronic banking and other projects. Some of those projects haven't been announced yet.

"We have projects under way directly aimed at establishing a secure, interoperable, open infrastructure," he said.

Schutzer said that to improve information security, users need hardware alternatives to software-based encryption — portable smart cards. Smart cards would eliminate the need to leave vulnerable encryption keys stored on the hard disks of users' PCs.

Users also should take a more holistic approach to security and not assume that all risks can be eliminated by one product or technology, such as encryption, he said.

The good news and bad news

Electronic commerce can ...

- Decrease cost of finding buyers and sellers
- Expand markets geographically
- Reduce time from outlay of capital to receipt of products
- Facilitate just-in-time production and payments
- Reduce cost of document creation, storage, movement
- Facilitate the maintenance of shareable historical data

... but unfortunately, systems today ...

- Still require paper exchanges for most transactions
- Automate only a portion of the entire transaction process
- Are costly to develop and operate
- Require highly structured, rigid arrangements
- Offer limited accessibility, interoperability and security
- Offer inadequate search capabilities

Source: Cross-Industry Working Team, Reston, Va.; E-mail: infoxiwt@cnri.reston.va.us/xiwt

AT&T plans 'breakthrough' server for multimedia use

By Neal Weinberg

AT&T engineers have designed a new breed of cat — a multimedia server that may make users of high-bandwidth data applications purr.

AT&T's Multimedia Communications Exchange (MMCX) server will link a company's voice and data networks and bring videoconferencing to the desktop. It is expected to ship in the first quarter of next year.

Videoconferencing

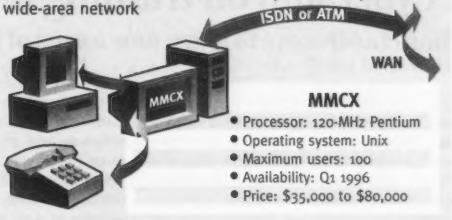
Unique position

AT&T isn't the first vendor to release a videoconferencing product, but analysts said no one else is doing it the way AT&T is, using communications middleware developed by engineers at AT&T's Bell Laboratories and its Global Business Communications Systems unit. The middleware was designed to allocate the proper bandwidth depending on how the system is being used.

"I don't think it is overhyping to say this is a breakthrough product," said Peter Bernstein, president of Infonautics Consulting in Ramsey, N.J. "The ability to provide simultaneous multimedia capability from the desktop, and be technologically agnostic at the same time, really is carving out a new market space."

Bernstein said one of the best things about the server is that it allows any combination of voice, data, image and video. For example, two users who are sharing a videoconference can add a third party who is on a voice call to the conversation. Users can add or drop various forms of media at will, he added.

AT&T's Multimedia Communications Exchange (MMCX) server combines phone and data systems, and adds video capability to allow full multimedia from desktop to desktop across a wide-area network



MMCX

- Processor: 120-MHz Pentium
- Operating system: Unix
- Maximum users: 100
- Availability: Q1 1996
- Price: $35,000 to $80,000

The server also can work as a simple LAN server. It can connect to AT&T's Definity private branch exchange (PBX), any other vendor's PBX or the public telephone network. However, an MMCX linked to a Definity system offers the best functionality, according to AT&T.

There are other videoconferencing products on the market, but this is the first that adds telephony features such as call forwarding, said Allan Sulkin, president of TEQConsult Group, Inc. in Hackensack, N.J. Using the MMCX server, point-to-point or multipoint videoconferences can be set up with the ease of a telephone call, he added.

Gary Andresen, an analyst at Dataquest, Inc. in San Jose, Calif., predicted that next year at least three vendors will release stand-alone multimedia servers that combine telephony and video in one box. But as the first to announce such a product, AT&T is taking a different approach than its competitors.

AT&T's server was designed to enhance, not replace, the PBX. Andresen said this is a wise move for AT&T because it protects the investment of Definity PBX users. Definity also is a high-margin product for AT&T.

The server supports LAN connections over switched Ethernet or Asynchronous Transfer Mode (ATM) and wide-area connections over Integrated Services Digital Network (ISDN) now and eventually over ATM. It will work with Unix-based workstations from Sun Microsystems, Inc. and Hewlett-Packard Co. It will support Windows-based PCs by late next year.

McDonald's Corp. has been beta-testing the MMCX server. Chuck Rush, global networking manager at McDonald's, said two crews of engineers, one in Oak Brook, Ill., and one in Fairfax, Va., have been sharing computer-aided design and manufacturing applications via MMCX teleconferences.

AT&T officials said the server initially can be used for concurrent engineering, financial services and entertainment. Future applications will include on-line medicine and manufacturing.

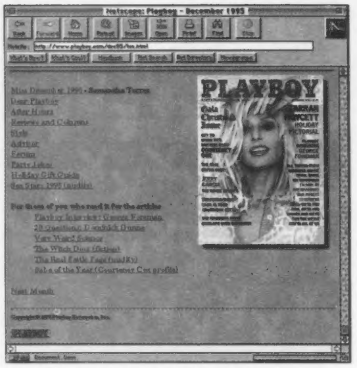
THE INTERNET PAGE

Sentry cuts access to naughty bits

By Mitch Betts

This year's headlines about cyberporn have been accompanied by a slew of software products that help parents and teachers restrict young people's access to offensive material on the Internet.

But now there is industrial-strength Internet filtering software specifically geared to businesses. Microsystems Software, Inc. in Framingham, Mass., recently began shipping Cyber Sentry, which helps network administrators enforce company Internet usage policies.



Cyber Sentry software *could be used to block employee access to* Playboy*'s home page*

For example, a company that uses Cyber Sentry could block employee access to sex, gambling and sports sites during the workday but allow access to sports information after work hours.

No-nos

The "CyberNot" list of blockable addresses is broken down into categories such as nudity, racist, gambling, cults, drugs and militant/extremist. The list is updated weekly and can be downloaded to the network administrator's workstation.

The software also can block access to unknown Internet addresses — sort of an outbound firewall — and keep an audit trail that can be used to look for patterns or to assign departmental billing.

Employers can use some of the Internet filtering products that primarily target the home and school markets, such as Cybersitter from Solid Oak Software, Inc. in Santa Barbara, Calif., and SurfWatch from SurfWatch Software, Inc. in Los Altos, Calif.

At Dow Jones & Co. in Princeton, N.J., Cyber Sentry is used to prevent people in Internet training classes from downloading objectionable materials to the classroom PCs, according to Alfred Kelvy, a technical specialist in the operations support department.

The move was prompted by a case where a student downloaded pornographic images from CompuServe to a PC hard disk. The material was later seen by a female student, who threatened to file a sexual harassment lawsuit, Kelvy said.

Nigel Spicer, president of Microsystems Software, said the No. 1 reason companies buy Cyber Sentry is to limit Internet exploration to business-related sites.

"The Internet is a supremely interesting place to be, but that is also its downside. Employees can spend a great deal of time on nonbusiness activities, such as fantasy sports leagues, which is distracting and hurts productivity," he said.

Spicer said some employees have complained about Big Brother surveillance, but he emphasized that blocking certain Internet sites is no different from business policies that prohibit employee telephone calls to 900 numbers.

There are other uses for Cyber Sentry. Will Hoersting, president of Premier Network Systems, Inc. in Anchorage, Alaska, said he uses Cyber Sentry to help a law firm client keep track of the time spent on Internet-based research. The logs are then used to bill legal clients.

Cyber Sentry costs $695 for a 50-user license, $995 for a 100-user license and $1,295 for a 250-user license. The annual support fee is $199.

IS tries to put cyberspin on training methods

Users can opt for on-line classrooms to learn new forms of technology

By Kim S. Nash

Faced with a learning curve that looks more like Mt. Everest than an arc, information systems departments are looking for faster, less expensive ways to teach — and be taught — new technologies.

Take Weyerhaeuser Co. The timber company in Tacoma, Wash., needed to bring roughly 20 IS staffers — located in several cities across the U.S. — up to speed on Microsoft Corp.'s Windows NT. Rather than send them to various classes at local training companies, Weyerhaeuser enrolled the staffers in an on-line course offered by Aris Corp., a computer training company in Bellevue, Wash. Aris and 29 other trainers are part of Microsoft's Online Institute, which offers courses through The Microsoft Network (MSN). MSN is currently available only to Windows 95 users.

Microsoft's Online Institute was created in the likeness of a college campus, said Neville Gordon-Carroll, director of worldwide strategic planning at Microsoft's education and certification division. Users can visit a student union to chat with other students, for example, or enter auditoriums for scheduled lectures.

Surfing coach

Meanwhile, when 3,000 members of the Clinton administration staff needed to learn how to hang ten with Netscape Communications Corp.'s Navigator browser for the World Wide Web, the White House hired a small tutoring firm to help.

Apte, Inc. in Evanston, Ill., created Internet Coach for Netscape, a Windows-based package that guides novice Web surfers at their own pace through the twists and turns of Navigator. Internet Coach costs $49.95.

On-line services such as the Internet and MSN can provide convenient ways for user companies to train employees without having to pay for meals, travel and other costs related to traditional in-person education, said Jeff Gilles, vice president of education at Aris. He estimated that by using on-line training, Weyerhaeuser saved 35% to 38% over the cost of sending its employees to the same courses in Aris classrooms. Weyerhaeuser officials couldn't be reached for comment.

Yet Gilles is realistic about the limits of network-based study. In fact, just 2% of Aris' revenue this year will come from on-line classes, he said.

A large roadblock to on-line education, he noted, is that students or the companies they work for will have to supply the hardware required to take the courses. Traditional training firms make that gear available to students in the classroom.

"Of course, sometimes there is no substitute for the hand-holding of an instructor, but we are trying hard to emulate that atmosphere," Gordon-Carroll said.

http:

Java, Sun Microsystems, Inc.'s programming language for building World Wide Web applications, isn't yet classified by Sun as a generally available, supported product. But Java is whipping up a storm among developers who have dabbled with free test versions for the past few months.

HOT SITES

- Sun last week announced a beta-test edition of Java Developer's Kit 1.0, which can be downloaded from **ftp://java.sun.com/pub/JDK-beta-solaris2-sparc.tar.Z** or **ftp://java.sun.com/pub/JDK-beta-win32-x86.exe.**
- Novices may want to start with Java's most frequently asked questions at **http://java.sun.com/JDK-beta/faq.html.**
- Plenty of Java enthusiasts have created their own Web sites that demonstrate how to use the product. JavaZone, for example, shows samples of Java applets, or miniature applications. See **http://metro.turnpike.net/S/suen_g/java.html.**
- Gamelan, at **http://www.gamelan.com/,** is an extensive directory of Java resources maintained by EarthWeb, an Internet design firm in New York. Meanwhile, known bugs are listed at **http://java.sun.com/JDK-beta/knownbugs.html.**
- Remember how learning the multiplication tables was easier when the teacher made a game of it? The same may be true for picking up the principles of Java. Check out Java-built versions of bowling at **http://java.cdt.luth.se/java/people/avh/Bowling/GoBowling.html;** Robot War at **http://www.dse.doc.ic.ac.uk/~np2/java/grid/robots.html;** and Minesweeper, a common pastime of Windows users, at **http://www.cc.gatech.edu/grads/s/Viren.Shah/java/mine/minesweeper.html.**

– Kim S. Nash

WEB PAGE CONTEST!

Computerworld is soliciting your vote for the best BUSINESS home page. Please give us the address of the page and a description of why it's the best in 100 words or fewer. We will pick the best pages based on CONTENT, GRAPHICAL IMPACT and USE OF LINKS.

The person(s) nominating the winning entries will receive Quarterdeck's InternetSuite (suggested retail price of $59.95), and the top pages will be showcased with your nomination in Computerworld early next year.

For your nomination to be valid, you must be an IS professional — no vendors or consultants, please. You must also have no affiliation with the page you nominate. Please include your name, title, organization and a phone number where you can be reached.

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Is it real, or is it LAN emulation software?

New standard gives ATM users way to communicate across nets

By Bob Wallace

Who says you can't get there from here?

Users expected they would have to junk their LANs to get the benefits of Asynchronous Transfer Mode (ATM) networks.

But the ATM Forum, an industry association with more than 800 members, and a group of early ATM users have developed a scheme called LAN emulation (see chart). It helps users bridge the gap between LANs and ATM networks.

ATM networks

Better communication

Products that incorporate the LAN emulation standard allow users on Ethernet and Token Ring LANs to communicate with users on ATM LANs. That means ATM LANs aren't islands unto themselves.

"LAN emulation is the foundation of users' ATM commitment," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "It's the only general way to run existing LAN applications at a site which has some ATM users."

Early ATM users agreed.

"Implementing LAN emulation is currently the only way we can transition from Ethernet and [Fiber Distributed Data Interface] backbone networks to ATM," said Chuck Rush, global networking manager at McDonald's Corp. in Oakbrook Terrace, Ill.

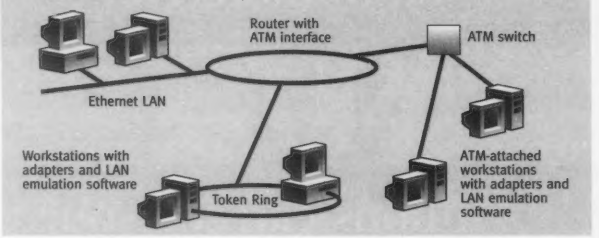
"That is important because ATM allows us to expand our networks in a far easier manner than can be done today."

To get started, users need to buy ATM adapter cards with LAN emulation client software for legacy LAN users and users on the ATM network with whom they need to communicate.

Many leading vendors such as IBM include the LAN emulation client software in the price of their ATM adapter cards.

IBM charges $400 for a 25M bit/sec. ATM Industry Standard Architecture bus adapter. It charges slightly more for its SBus and Micro Channel Architecture versions.

Ethernet and Token Ring users with ATM adapters and LAN emulation software can exchange data with ATM users who have the same cards and software



Procedures

While this sounds inexpensive, messages must go through a legacy LAN to a specially equipped router. The router must have an ATM interface and so-called proxy LAN emulation software.

To get an idea of what that costs, router market leader Cisco Systems, Inc. charges roughly $20,000 for an ATM interface. It includes the LAN emulation software with the latest version of its routing software.

The router passes the message to the ATM switch, which usually has "LAN emulation server" functionality built in.

The LAN emulation server functionality performs two key tasks: It converts LAN Media Access Control addresses to ATM addresses and sets up the data connection to the ATM workstation.

If the ATM workstation, not the legacy LAN user, sends data, the LAN emulation server functionality distributes broadcast messages to the router, which passes them to the right legacy LAN users.

Though LAN emulation currently is the best way to link legacy LANs and ATM-attached devices, it may not be the best method further down the road, Rush claimed.

The ATM Forum plans to include LAN emulation in its Multi-Protocol-Over-ATM (MPOA).

With MPOA, much of the advanced routing functionality required in stand-alone routers could be incorporated into ATM switches, Rush said.

The result could be a simpler, and possibly less expensive, scheme.

"LAN emulation isn't the best [long-term] answer, but it's the only answer for now," Rush said.

Users can sample the switching life

New simulation software measures impact of ATM, Ethernet on networks

By Patrick Dryden

As high-speed and interactive applications force information systems managers to upgrade their networks' performance, simulation software can help.

Simulation software lets planners test the impact of Asynchronous Transfer Mode (ATM) and Ethernet switches on their networks' speed. This week, Systems & Networks, Inc. will add two modeling modules to the Bones suite of network design and capacity planning tools that it acquired in April from Comdisco, Inc.

> **"The Ethernet module helped us identify issues before installing switches in our production environment."**
>
> — Shawn Farschi, DHL Airways

The modules are libraries of performance specifications for popular ATM and Ethernet switches. The statistics have been amassed from tests and users.

With the modules, designers can test the impact of competing vendors' switching gear on their current and projected network traffic.

"The Ethernet module helped us identify issues before installing switches in our production environment," said Shawn Farschi, manager of the network engineering group at DHL Airways, Inc. in Redwood City, Calif. "Now we understand what response time and utilization to expect."

New and improved

Systems & Networks in Santa Clara, Calif., is improving the switching and frame-relay components. It also will add ATM consulting packages to help users plan performance overhauls.

Demand for tools that take the risk out of designing high-performance networks will boost the planning and optimization market from $32 million this year to $337 million in 1998, according to Infonetics Research, Inc. in San Jose, Calif.

Driving this demand are companies such as San Francisco-based Charles Schwab & Co. Schwab will use the Ethernet switch module with Bones to find the best configuration of shared and switched LAN connections for field offices in a system rollout. It is installing Microsoft Corp. Windows NT-based workstations and Unix servers for about 6,000 users, said Ron Welf, senior technical lead for the firm's network performance and capacity planning group.

"Our shared Ethernet segments are running out of steam as we implement new client/server queries and investigate video delivery," Welf said. "Now we can question the speed increase options, sample where to place Ethernet switches and see how to selectively alleviate bottlenecks."

But these pricey tools (see chart) may not be worthwhile for users with smaller networks who need quick boosts of bandwidth from Ethernet switches, said John Morency, principal at The Registry, Inc., a consultancy in Newton, Mass.

"Workgroup Ethernet switches are so cheap that it may be better to just deploy them for immediate advantage rather than try expensive modeling software," he said. Morency said the Bones software suits big collapsed backbone configurations.

Morency also said ATM planners will find Bones most useful because specific applications require ATM performance. Yet adopters must stick to single vendors instead of taking a piecemeal approach until all ATM standards are complete.

Q & A

New ATM and Ethernet modules from Systems & Networks can help answer the following questions:

- **How should clients and servers be placed around switches?**
- **Will switches supply sufficient bandwidth for new applications?**
- **Where will bottlenecks appear next?**
- **What's the best virtual LAN setup for Ethernet switches?**
- **Will LAN emulation over ATM work or are ATM adapters required?**

Price is right

Systems & Networks offers the ATM modeling library for $10,000. It includes Cisco Systems, Inc.'s LightStream 2020, Fore Systems, Inc.'s ASX-200 and Bay Networks, Inc.'s LattisCell switches.

The Ethernet switch library costs $7,500 and models the performance of the 3Com Corp. LANPlex, Bay Networks' LattisSwitch, Cisco's Catalyst, Grand Junction, Inc.'s FastSwitch 10/100 and Kalpana, Inc.'s EtherSwitch.

Prices for the Bones suite range from $30,000 to $60,000, depending on the modules needed and Unix-based planning engine.

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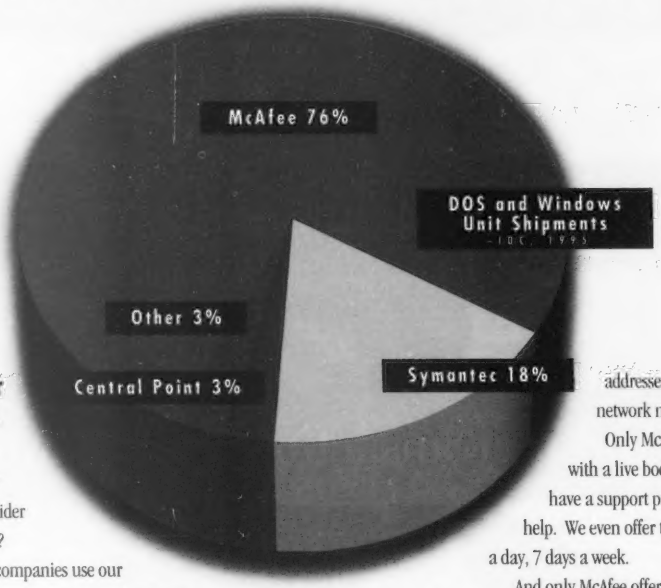
How The World's Biggest Anti-virus Company



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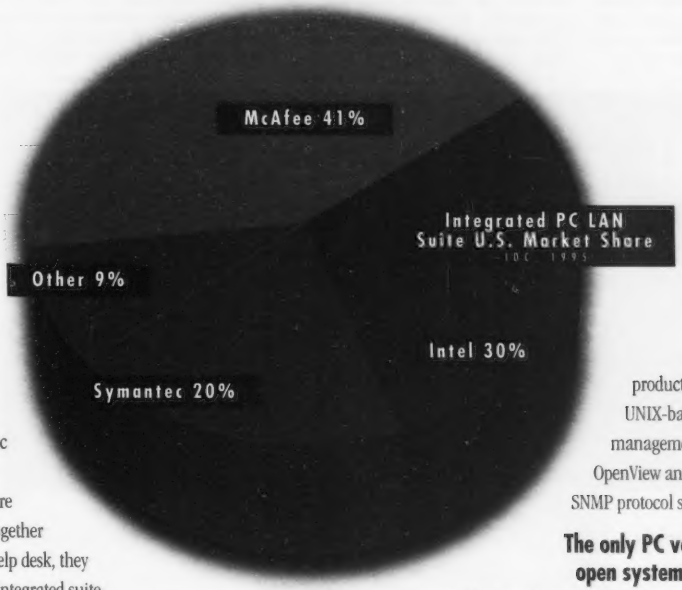

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Low-cost Congo tames router jungle

By Bob Wallace

Router power Advanced Computer Communications Corp. (ACC) recently shattered the $1,000 remote Integrated Services Digital Network (ISDN) router barrier with the Congo bridge/router.

By pricing feature-packed Congo at roughly $900 — considerably less than competing products from router market leaders — ACC enables users to lay the groundwork for telecommuting programs and extend networks to small offices.

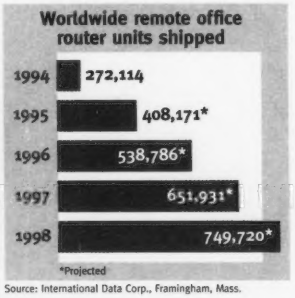
"There's certainly been a flood of products for the small office/home office market over the last year, but product pricing has prohibited many users from actually bringing these sites onto enterprise networks," said Maribel Howard, a research analyst at International Data Corp. in Framingham, Mass. "But products like Congo will change that."

Congo can also be used to access the Internet and on-line services.

Users say they expect vendors to lower prices for these products. They also anticipate that companies without products in this market will enter with inexpensive wares.

"[Nine hundred dollars] is definitely where the industry is headed, which is great for large companies with small four-person offices and for companies that want to support telecommuters," said Mel Marcus, president of Reliable Data Communications in Chicago, an ACC site. "If you use both channels of the [Basic Rate Interface] with 4-to-1 data compression, you're offering 512K bit/sec. to the home, which is pretty attractive."

ISDN Basic Rate Interface (BRI) lines each have two 64K bit/sec. B channels that can be combined to form one 128K bit/sec. channel for applications such as midsize file downloads, whiteboarding and desktop videoconferencing.



Source: International Data Corp., Framingham, Mass.

Ready to go

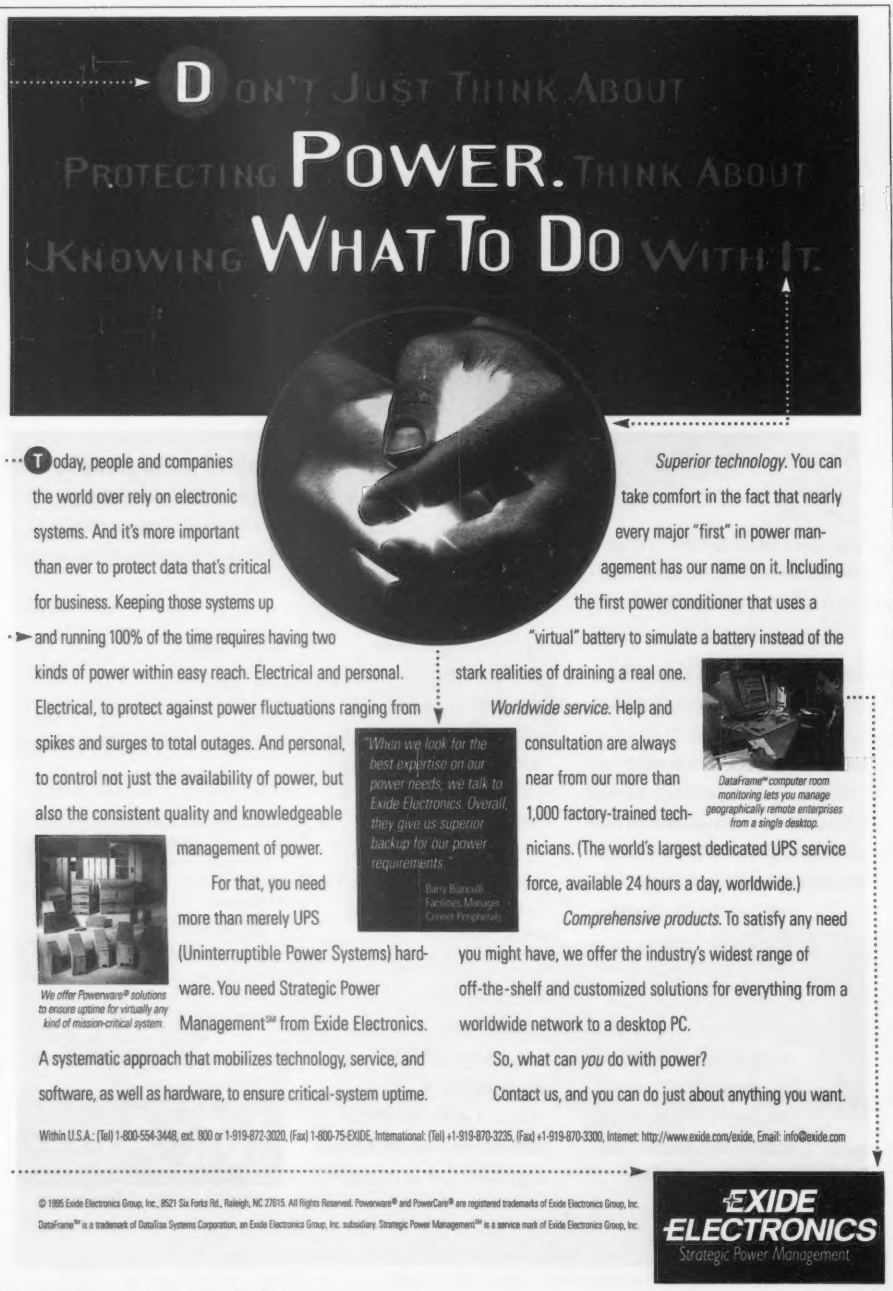
Although ISDN is not ubiquitous, every regional Bell holding company claims that more than 50% of its total network lines have access to ISDN, according to recent reports filed with Bell Communications Research.

Analysts said Congo is the least expensive ISDN bridge/router they know of and that rival units from Cisco Systems, Inc. and others cost hundreds of dollars more. More important, they agree that the future for this segment of the internetworking market is rosy for users.

"There's no doubt that this product will help fuel a continuing price war," Howard said. She said this would result in products with additional features at lower prices.

Congo offers one Ethernet port, one ISDN BRI port, IP routing, transparent bridging and extras such as 4-to-1 data compression, Express Queuing, Dial on Demand, Dial on Congestion and multilink Point-to-Point Protocol.

Data compression means faster data transfer, while Express Queuing provides automatic dynamic allocation of available bandwidth per session. Dial on Demand initiates data calls only when data must be sent, and Dial on Congestion allows the second B channel to be used during peak periods.



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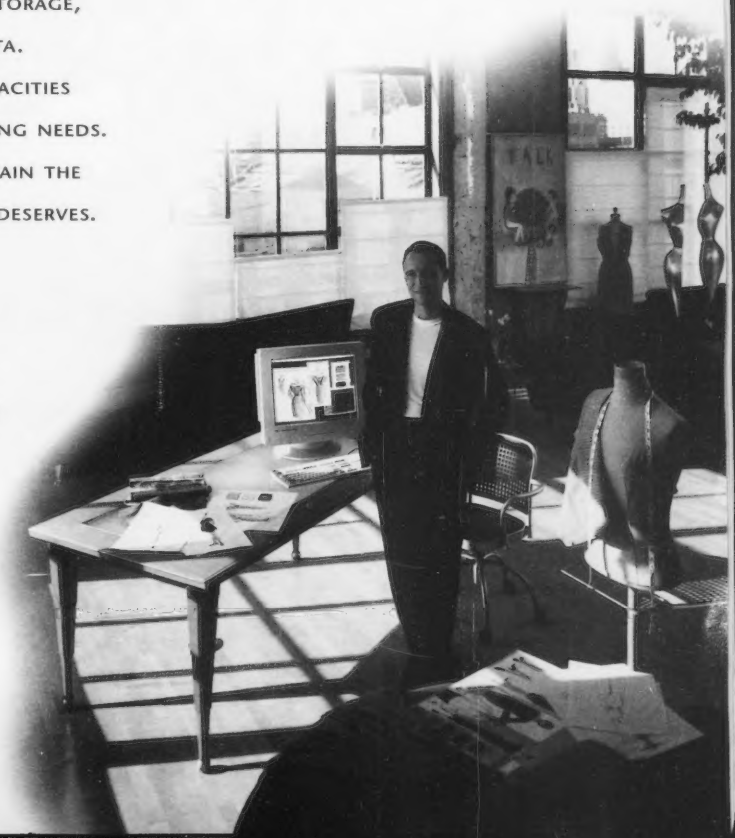

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hard

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See, I had a chance like that once, long before there were any computers, and big Fortune 500 companies were even usin' processors like that quick little MIPS RISC thing.

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'Howdy miss,' he said, 'I'm sure you're aware of this new refreshment that's sweepin' the south.'

Then he held up that bottle.

'Well,' he went on, 'we're lookin' for investors, 'cause we want to expand.'

Then I said, 'Mister, I sure do like your drink, but tryin' new things like that really isn't in my nature.'

'Suit yourself', he says, tips his hat, and walks away.

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Then they said it was the same MIPS RISC processor that Microsoft® used to develop Windows NT. You can't get much more impressive than that. Plus there are lots of people just like you at big companies usin' it already.

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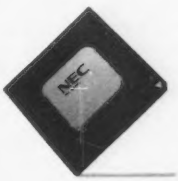

NEC

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New Products

Excalibur Technologies Corp. has introduced RetrievalWare Web Server, an upgrade to its World Wide Web server integration kit.

According to the San Diego company, RetrievalWare Web Server is a Web search system that can search for word meanings and word relationships. It incorporates robust fuzzy text searching and supports Excalibur's family of image- and signal-retrieval servers. It also incorporates an integrated security server.

RetrievalWare Web Server supports large-scale, distributed electronic publishing and enterprise applications. It deploys a front-end server that handles large volumes of user queries, integrates with relational databases and accounting systems and supports a fully distributed, multiprocessor-based architecture. RetrievalWare Web Server also provides a common gateway interface based on templates and a macro language for creating Hypertext Markup Language pages. And it features an integrated security server.

RetrievalWare Web Server operates on Unix and Microsoft Corp.'s Windows NT platforms. It costs $12,500.

▶ *Excalibur Technologies*
(619) 625-7900

Wollongong Group, Inc. has introduced Emissary 1.1, Internet software.

The Palo Alto, Calif., company said Emissary 1.1 lets business users browse, access, organize and work with corporate and Internet-based information. It uses object architecture to combine a range of Internet facilities into a single, integrated Windows application. These facilities include World Wide Web browsing, mail, news reading, file retrieval and management, and interactive access.

Emissary 1.1 includes automatic upgrade capabilities that let users click a button to download and install the latest version of complete applications from the Internet. It also lets users write electronic mail off-line and save drafts in folders off-line.

For security, Emissary 1.1 incorporates Microsoft Corp.'s Private Communications Technology and Secure Sockets Layer security and key encryption.

Pricing for Emissary 1.1 starts at $99.

▶ *Wollongong Group*
(415) 962-7100

NetPro Computing, Inc. has introduced DS Expert for NetWare 4.1, a network utility product for Novell, Inc.'s NetWare.

According to the Scottsdale, Ariz., company, DS Expert for NetWare 4.1 was designed to monitor, troubleshoot and optimize NetWare Directory Services (NDS). NDS is similar to a telephone book; it lets any object on the network look up another object to determine its location and the services it provides. DS Expert for NetWare 4.1 presents multiple-server NDS information simultaneously in a graphical format.

DS Expert for NetWare 4.1 features alerts to warn of partition viewing, partition and replication errors, server time synchronization and low disk space.

Pricing for DS Expert for NetWare 4.1 starts at $1,299.

▶ *NetPro Computing*
(602) 998-5008

Rad Network Devices, Inc. has announced Vgate, a virtual router.

According to the Costa Mesa, Calif., company, Vgate is a virtual router that can work with any vendor's Ethernet LAN switch. It offers low latency, with wire-speed IP and IPX routing among Ethernet LANs and virtual LANs (VLAN). Vgate comes in two- and four-port versions. It can connect up to four switched LANs and interconnect all associated VLANs.

Vgate was designed to define several IP and IPX networks on a single Vgate port. Routing occurs among VLANs when the appropriate LAN switch port is defined as a member of several VLANs. Vgate identifies the frames that need to travel from one VLAN to another and processes them.

Vgate costs $3,000 for the two-port version and $4,500 for the four-port version.

▶ *Rad Network Devices*
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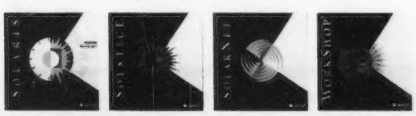

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**University of Texas Center of Research on Information Systems, Datamation, June 15, 1994*

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Large Systems

HARDWARE • SOFTWARE • CORPORATE STRATEGIES

IBM pledges year 2000 update in '96

By Mitch Betts

As the clock ticks away toward the turn of the century, IBM plans to help information systems departments deal with the "year 2000 problem." The company recently promised to fix all of its hardware and software to handle four-digit years before the end of 1996.

The problem is caused by two-digit date fields that appear as 00 for the year 2000. That will foul up date-critical calculations for loans, bills, payroll, forecasts, insurance, personnel records and the like.

Many IS departments are now identifying the two-digit date fields buried in millions of lines of code so the fields can be expanded to four digits. But experts fear time is running out for the expensive, labor-intensive process.

Turn of the century

Here is a list of resources to help cope with the year 2000

- **IBM'S YEAR 2000 CUSTOMER GUIDANCE PAPER**
  http://www.software.ibm.com
- **THE YEAR 2000 HOME PAGE**
  by Peter de Jager
  http://www.year2000.com/
- **"TICK, TICK, TICK . . ." NEWSLETTER, NEW YORK**
  (800) 643-8425
- **"YEAR 2000 NEWS" ELECTRONIC NEWSLETTER**
  Put "subscribe" in the subject line of an E-mail message to new-2000-request@andrew.cais.com

Late to the party?

Analysts and users unanimously praised IBM for addressing the problem and raising its visibility. But many also echoed the concerns of one analyst who complained that getting updated software in 1996 is "pretty late in the game."

That will leave just two years for IS shops to clean up their systems before real-life testing begins in 1999, noted Bill Goodwin, president of 2000AD, Inc., a consultancy in New York.

"I'm kind of disappointed

IBM, *page 87*

Objects of desire

Transaction monitor vendors plug in to object-oriented apps

By Craig Stedman

Transaction monitor users will soon have something to "object" about.

IBM, Novell, Inc. and other makers of transaction monitoring software are starting to open their products to object-oriented applications. That will provide a way for object-equipped end users to get at data stored on multiple servers with the reliability, robustness and data integrity that are the calling cards of transaction monitors.

Vendors' embrace of object technologies such as Microsoft Corp.'s OLE extends their efforts to harness the complexity of transaction monitors and position them as general-purpose middleware for stitching together distributed environments.

Plan for the future

Transaction monitors allow for "a much more robust system than your usual client/server applications," said Mark Richards, a systems consultant at Bankers Trust Co. in New York.

Monitoring the monitors

Worldwide projected 1995 market share for Unix transaction monitors

Total market: $177 million

Source: The Standish Group International, Inc., Dennis, Mass.

Bankers Trust is developing a financial application built around Novell's Tuxedo software, and the promise of object support "fits perfectly in where we want to go," Richards said.

OLE allows desktop clients to pass data encapsulated as objects back and forth. With a transaction monitor, end users running OLE applications would be able to grab data from mainframes and other servers without requiring a direct connection or even knowing where the information is stored, analysts said.

"You don't have to know how you're getting the information. You just know that you're getting it back," said Paul Tocatlian, technology director at Tangent International Computer Consultants, Inc. in New York. Tangent designs applications with transaction monitors for financial, telecommunications and health care customers.

IBM in late October started field-testing object-oriented client versions of its CICS monitor. It said those versions will be able to communicate with OLE on Windows 3.1 and with the rival OpenDoc technology on OS/2. Shipments are expected early next year, said Geoff Sharman, a CICS strategy and marketing consultant at IBM.

IBM's rivals are also preparing their transaction monitors

Objects, *page 82*

Client/server vendors use Internet as selling tool

By Julia King

Two vendors of client/server customer management software are leading the wave of companies tapping the Internet to extend user access to their systems.

World Wide Web

Vantive Corp. and Aurum Software, Inc. are the first two in what analysts expect to be a long line of vendors offering integrated products that let companies tap the Internet to inexpensively market their wares to new customers — and to support current clients as well.

Vantive's new VanWeb product allows companies to put sales, marketing, customer support and help desk data on the World Wide Web. Customers must use Vantive Enterprise applications to process the data.

From there, users — including salespeople and customers — can employ any Web browser, such as Netscape Communications Corp.'s Navigator, to download marketing leads, retrieve product information or track repair orders.

US West Communications in Denver, which uses Vantive's help desk software to support internal PC users, plans to use VanWeb to extend that support to approximately 65,000 employees via the Internet.

Other applications are possible, said Tim White, a US West Communications manager.

"Any user or customer with access to the Internet and a Web browser can access a range of information relating to the customer enterprise," White said.

Benefits of using client/server applications on the Web

- Universal availability of sophisticated applications
- Inexpensive access to mission-critical applications
- Platform independence
- Ease of use

"This offers tremendous functionality for an organization like US West."

Another Vantive user, Trimble Navigation Ltd., a $250 million manufacturer of global positioning systemsr, will install VanWeb so its globe-trotting field engineers can access product information anytime, anywhere. Eventually, its distributors and end users will be able to access that information, too.

"This is an opportunity to use the Internet rather than dial directly in to our network, which is very crucial because not all countries have good telephone technology," said Eberhard Waiblinger, Trimble's information systems manager.

Electronic junk mail

Aurum's new Web-Trak Internet Marketing Module functions like an electronic version of direct mail. Using the software, a company can publish information about its products on a Web page. It can also retrieve information posted there by Web site visitors [CW, Nov. 6].

This information is then automatically sent via Aurum's sales force automation software to a corporate database where it can be combed for potential sales leads.

This may raise privacy concerns among Web surfers, but a certain loss of privacy is a tradeoff users may have to make for the convenience of retrieving information from the Web, said Hugh Bishop, director of emerging technologies at Aberdeen Group, Inc. in Boston. "If you're interested in a company's products and you go on their home page, you're giving up some of your privacy," he said.

"We're hypersensitive to privacy in the U.S. It's not as though they're downloading your tax records and then contacting you about them," Bishop added.

The first Web-Trak products are scheduled for delivery next month. It will be sold as an add-on to Aurum's sales force automation software. Pricing ranges from $7,500 to $10,000.

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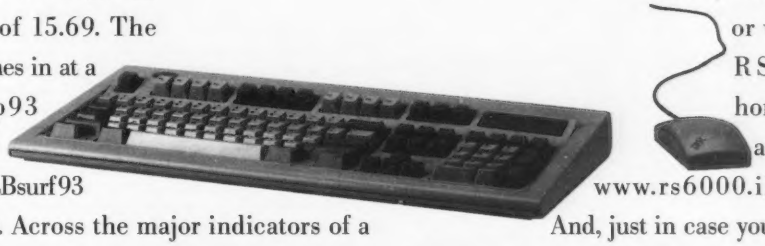

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Objects

CONTINUED FROM PAGE 79

for an object future. AT&T Global Information Solutions said it intends to announce an initial OLE interface to its Top End software in the first quarter. Novell, the leading vendor of Unix-based transaction monitors, plans to enable OLE clients to make use of Tuxedo's transaction services in the first half of next year, said Ivan Ruzic, director of marketing for Novell's Distributed Services division.

Further down the road, Novell and IBM plan to add support for the Object Management Group's Common Object Request Broker Architecture (CORBA) specification, which would allow multiple servers in a network to pass around objects. But that probably won't happen until 1997, the firms indicated.

"Technically, there are some challenges to solve in that area," Sharman said. Meanwhile, Ruzic noted that Novell wants to get its support for CORBA in sync with the release of an expanded version of the CORBA specification that is now in the early stages of discussion.

Tuxedo target

Interactive Telephone Co. in Hackensack, N.J., uses Tuxedo mainly to do automated transaction routing for authorizing and billing phone calls made with the calling cards it markets. Back-office employees have limited access to Tuxedo now, but Interactive wants to take a look at the OLE-to-Tuxedo interface when it becomes available, said Sid Huang, the company's president.

"Object stuff is the wave of the future, and I'm glad to see Novell is taking [Tuxedo] in other directions" to augment its traditional transaction processing role, Huang said. However, he added that one concern with using OLE is the potential for increased processing overhead.

Going through an OLE interface will add a processing step and likely slow things down compared with hooking clients directly into a transaction monitor, said Ross Altman, vice president of marketing at Magna Software Corp. in New York. Magna makes tools that generate applications for several transaction monitors.

However, for applications that can afford to give up some performance, OLE support will "really open up the world," Altman said. "Response time is the issue here, and it's a typical trade-off."

The meaning of it all

A glossary of transaction and object terms:

- **Transaction processing monitor:** Software that manages the mechanics of providing end users with reliable access to distributed data. A monitor synchronizes systems, network and application resources and handles tasks such as user authorization, security and restarts.
- **OLE:** A set of object-based technologies from Microsoft for integrating applications and software components. OLE provides a way for application programs running on desktop systems to exchange data in object form. IBM and other vendors back OpenDoc, a rival technology.
- **CORBA:** A specification developed by the Object Management Group for exchanging software object modules from server to server or from server to client. Multiple vendors have developed object request broker products that conform to the CORBA spec.

CA to use 3-D interface in integrated app suite

By Thomas Hoffman

Drawing from the same three-dimensional interface technology it is incorporating into its CA-Unicenter systems management suite, Computer Associates International, Inc. has announced plans to integrate several key applications with CA-Unicenter.

Those include financial, manufacturing, distribution and human resources applications.

The effort will make use of the 3-D interface and an as-yet-undetermined workflow technology to help users easily navigate between applications and modules. The first package to be integrated with CA-Unicenter will be CA-ManMan/X manufacturing business software.

Thiokol's Brad S. Stout: *'We have a corporate bias toward moving to common applications between units'*

Pricey plan

Potential users said they liked the concept behind CA's integrated workflow environment, although few seemed eager to whip out their checkbooks.

"It looks like it has a lot of potential, but I'm not sure if we'll be able to afford it," said Don LaFerla, vice president of MIS at Leggett & Platt, Inc., a Carthage, Mo.-based maker of bedding and furniture components. LaFerla said he saw a demonstration of the system at a CA-sponsored manufacturing conference in Orlando, Fla., last month.

Roger Williams, a computer-integrated manufacturing engineer at Polaroid Corp. in New Bedford, Mass., said he was impressed with a 3-D visualization demonstration at a CA conference in August. "I'm more of a project manager than a programmer, so anything that helps me tie in to the code more easily is a real plus," Williams said.

But because his shop is a heavy user of Digital Equipment Corp.'s VAX/VMS systems — for which a CA-Unicenter port has not been developed — Williams said he doesn't see his organization taking the leap to the next-generation manufacturing/business system. "It's a nice looking product. I just can't use it," Williams said.

Quick add

CA's integration scheme is meant to "allow our clients to implement these systems at much more reasonable costs in a shorter time frame," said David Cahn, director of product strategy at CA in Islandia, N.Y. He claimed users will be able to install CA's fully integrated system (once it becomes available next year) over a weekend in certain cases.

Costs for the integrated business systems, which are being developed to run on Microsoft Corp.'s Windows NT and on leading Unix platforms, will be announced by year's end. At that point, the ManMan/X and CA-Unicenter suite will go into beta testing, Cahn said.

For this integrated suite, CA plans to use the same pricing model it has in place for its CA-PRMS integrated manufacturing system. Users will pay a one-time licensing fee and a per-user charge.

Thiokol Corp. considered purchasing ManMan/X for its Huck International subsidiary in Irvine, Calif., which makes fastening systems. But because Thiokol is standardizing on IBM's next-generation Synova MRP II software at its Ogden, Utah, headquarters, it is unlikely that the defense and aerospace manufacturer will choose a different manufacturing system for one of its subsidiaries, said Brad S. Stout, vice president of information systems and chief information officer at Thiokol.

"We have a corporate bias toward moving to common applications between units," Stout said.

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Brief

Object DBMS promises ODMG compliance

O2 Technology, Inc. in Palo Alto, Calif., is shipping a version of its object-oriented database management system that it said complies with three out of four interoperability specifications from the Object Data Management Group (ODMG). Called the O2 ODMG Database System, the $3,000-per-seat product complies with specifications for data model, query language and C++ interface set forth in the ODMG '93 Standards.

The more compliant with these specifications, the more likely an application is to be portable among compliant object DBMSs, the vendor claimed. O2 is promising compliance with the fourth specification, the Smalltalk interface, by early next year.

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PERHAPS, if she knew more about the role of reusable objects in the development process, there'd be *room for us* as well.

When you're dealing with very sick kids, the consequences of getting the right information to the right place at the right time are monumental. To say it's a matter of life and death is fact, not hyperbole. The people of Texas Children's Hospital were all too aware of this and set about building a system that would ultimately place a patient-record workstation in every room. A system that would automate clinical information for more accurate diagnoses and improved treatment. A system that would become as integral a part of ensuring quality healthcare as the stethoscope. A system they built with PowerBuilder® Enterprise.

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By reusing objects, development with PowerBuilder became faster and more intuitive while, at the same time, more sophisticated. PowerBuilder's openness provided native connectivity to Microsoft's SQL Server database. And PowerBuilder's RAD prototyping allowed a flexible, iterative design process that involved end-users, creating an application that matched their needs. Now there are workstations that Texas Children's Hospital just can't do without. Just ask the doctors. Or, better yet, ask Marisa Hernandez's mother.

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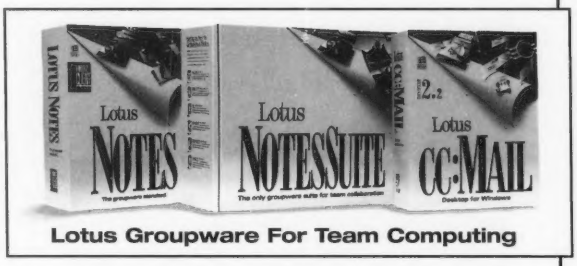

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Firm thrives on client/server consulting

Cambridge Technology Partners imposes IS order

By Mitch Wagner

Just a few miles from Harvard University in Cambridge, Mass., where great minds work to impose order on the sum total of human knowledge, the minds at Cambridge Technology Partners (CTP) are trying to impose order on corporate information systems.

Systems integration

The 4-year-old company has built a fast-growing business and an excellent reputation by helping its customers make unified, interoperable enterprise systems out of departmental systems. Ideally, the job is done without substantially replacing legacy systems. Instead, CTP helps build new systems that coordinate the legacy systems.

"There is all this hyperbole and melodrama about client/server computing, and now people are finding that it's not sufficient," said Malcolm Frank, vice president of marketing at CTP. "A lot of people say they need an application that provides them with a comprehensive view of the relationship with the customer."

A second prong of CTP's strategy is rapid prototyping. Using an array of customizable development tools developed in-house, CTP helps build new enterprise applications in six to 12 months, compared with an average of 12 to 24 months for other methods, according to Frank.

At a Glance

Cambridge Technology Partners
Cambridge, Mass.

1994 revenue: $60 million
1995 revenue: $130 million*
Number of employees: 1,100
*Estimated

Rapid application development is essential for customers to get the maximum return on investment because computer technology becomes obsolete in less than five years, he said. CTP has its own object-oriented software tool set, with a server running on Microsoft Corp.'s Windows NT and common Unix versions and a client running on Windows.

However, analyst Bonnie Digrius of Gartner Group, Inc. in Stamford, Conn., said CTP needs to focus on a small number of industries to define itself to users. Without that focus, the company may be unable to compete with multibillion-dollar rivals such as Andersen Consulting and Electronic Data Systems Corp. "The differentiator of being 'a client/server consultant' is passe," she said.

Specialization in a single industry would be a losing game, Frank responded. "Our view is that it's systems integration death," he said. "We're not going to go in and tell an investment banker how to trade bonds better or an aerospace company how to build jet engines better."

At Air Products and Chemicals, Inc. in Allentown, Pa., CTP helped bring together records for 60,000 customers at 80 sites into a single, unified whole. "Our experience with CTP was super," said Roger Bast, director of information technology for Air Products. "We thought our original approach would take two years. We were able to do it in six months. We've cut several million dollars in cost and shifted our mainframe functionality elsewhere."

CTP's successes have fueled rapid growth. This year, it expects to bring in $130 million, up from $60 million last year. It now has 1,100 employees, up from about 500 at the end of last year. The new staff includes about 300 people brought over from two companies acquired by CTP since August — Axiom Management Consulting, Inc. in San Francisco and Systems Consulting Group, Inc., a systems integrator in Miami.

Of CTP's competitors only Andersen Consulting can offer the same combination of management and technology expertise, said Tom Willmott, an analyst at Aberdeen Group, Inc. "In terms of their overall company strategy, they're clearly on fire," he said.

In management consulting, CTP competes with Bain & Co., McKinsey & Co. and Booz Allen & Hamilton, Inc. On the technology side, CTP competes with systems integrators, including EDS and Computer Sciences Corp., and smaller firms such as Trecom Business Systems.

IBM

CONTINUED FROM PAGE 79

[IBM] waited so long," said Charles Parks, project manager for the year-2000 upgrade at Union Pacific Railroad in Omaha. Parks added that some software vendors are even further behind in announcing plans for addressing the problem.

"We've known for some time that [our version of IBM's] IMS is not year 2000-compliant. We are upgrading our software to be year 2000-compliant, but if it uses an IMS database, regardless of what we do on our side, it's still a problem," Parks explained.

An IBM document said customers will need to upgrade to the latest version, IMS/ESA 5.1, which is 2000-ready.

Carla Gude, IBM's director of system software structure, objected to the criticism that IBM is late. She said the latest versions of many IBM products are already 2000-compliant. "We started with products like AIX and our C++ compiler, which were year 2000-ready when they shipped," Gude said.

A full list of IBM's 2000-ready products is included in a 180-page customer guide available on the Internet (see page 79). For example, VM/ESA Version 2 will be 2000-ready when it comes out next year, an IBM official said.

IBM also announced that its Integrated Systems Solutions Corp. subsidiary will provide consulting and programming services — dubbed Transformation 2000 — to help time-pressed IS shops make changes.

New Products

JBA International, Inc. has announced Screenview.

According to the Rolling Meadows, Ill., company, Screenview automatically converts existing IBM AS/400 screens into fully functional graphical user interfaces without any preparation procedures.

Screenview converts data without affecting the AS/400 application in any way, letting PC users operate the AS/400 application as a PC application. Screenview filters screen calls and modifies them, enabling PC users already running a PC session and using a mouse to point and click, move windows and change color and font selections.

Screenview costs $199 per PC.

▶ *JBA International*
(708) 590-0299

Hewlett-Packard Co. has announced the HP C3653A, a high-performance 8.7G-byte hard disk drive for use in mainframe storage products.

According to the Palo Alto, Calif., company, the HP C3653A is a 7,200-rpm drive based on a dual-stripe magneto-resistive recording head design. The SCSI-2 drive has 10 disks in a 3½-in. design. The drive's sustained data transfer rate is 6.3M to 8.9M byte/sec.

Pricing for the HP C3653A drive starts at $1,500.

▶ *HP*
(415) 857-1501

Legato Systems, Inc. has introduced the NetWorker Database Module for Oracle.

According to the Palo Alto, Calif., company, the NetWorker Database Module for Oracle provides high-performance protection for Oracle Corp.'s Oracle7 database running on Unix.

The module works with the Oracle7 Enterprise Backup Utility to let database administrators back up the database while it remains on-line and in use.

The NetWorker Database Module for Oracle features automatic media and database configuration tracking. It also includes unattended operations and can be scheduled for partial or full backups on a regular or rotating schedule.

The NetWorker Database Module for Oracle costs $9,000 per NetWorker server.

It can be installed on Sun Microsystems, Inc.'s Solaris 2.3 or later. It is scheduled for availability on IBM's AIX 3.2.3 and Hewlett-Packard Co.'s HP-UX 9.0.

▶ *Legato Systems*
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Application Development

Tools help solve crash mysteries

By Frank Hayes

When it comes to software, sometimes it seems like everyone's a beta tester: All software still has bugs when it reaches end users.

But end-user "testers" have real work to do — they don't have time to document bugs and track problems. And though that attitude doesn't make developers' jobs any easier, some information systems executives feel the same way.

"I know when I get problems with my operating system and I call Sun and they ask me to reproduce the problem, my reaction is, 'I don't give a damn!' " said a vice president in charge of an information infrastructure group at a Wall Street trading firm.

As a result, minor problems with applications may not be reported at all. And for major problems, users often can't tell developers anything more than "it crashed."

But new software can help capture information about how systems are being used when they crash and when they don't.

Last week, Centerline Software, Inc. in Cambridge, Mass., announced QC/Recall, which

Tools, *page 92*

Cause and effect

The following products help developers find out what users were doing before an application crashed

VENDOR/PRODUCT	PRICE
Centerline Software Cambridge, Mass. QC/Recall	$25,000 for 15 seats
Pure Software Sunnyvale, Calif. PureVision	$47,500 for 15 seats

Cheryl Gerber

Who needs objects?

Although distributed objects and visual application development languages are hot and getting hotter, the use of software components probably won't grow into the mainstream in this decade, if ever.

The reason is simple: There is no infrastructure to support them.

Let's say you detached five applications from an integrated suite and strung them together in a series of related software components, as Lotus was rumored to be doing with SmartSuite. How would you package the components? How would you manage distribution? What about version control and support? Can you imagine the software licensing issues?

But suppose we could answer all these questions. Where are the operating systems to support software components? Cairo is a couple of years away. And the alternatives to Microsoft's OLE interface, such as the Object Management Group's Common Object Request Broker Architecture, are stuck in a standards standoff with Microsoft. One can argue tirelessly about the technical superiority of one object standard or another, but OLE leads by a wide margin in the market.

Decomposing software into components (objects) doesn't have to mean decay. It could make customizing easier and more creative.

And sustaining a few software components as reusable standards would make sense in an internal development envi-

Gerber, *page 92*

DAVID MARSHALL

FDA failure

Report reveals poor management of automation project

By Gary H. Anthes
WASHINGTON

Sloppy project management could mean bad food on your table.

After $14 million and eight years of effort, the Food and Drug Administration's system for screening imports is only partly implemented, and its deficiencies may allow unsafe foods and medicines into the U.S., the U.S. General Accounting Office said in a recent report.

In a how-not-to-do-it guide to systems development, the GAO said FDA project managers weren't experienced in systems development, no requirements analysis was performed, no user-acceptance testing was conducted, no security plan was developed, no cost/benefit analysis was done, project costs were not accounted for and no operational performance measures were developed.

In 1975, the FDA processed 590,000 import shipments; this year it will handle 3 million.

Guilty as charged

"We plead guilty," said Frank Flaherty, a director at the FDA's Office of Regulatory Affairs. "We did not do the kinds of things that one is supposed to do developing a major system."

Flaherty said the project had lacked top management commitment and was managed by people with too many things to do.

Flaherty added, however, that the GAO's scathing report was based on outdated information and that the FDA began to "substantially turn around" the project in late 1993 after congressional hearings put a spotlight on it. All of the project's missing pieces have now been completed or are being worked on by a new development contractor, he said.

The Operational and Administrative System for Import Support (OASIS) will automate the FDA's screening of foods, drugs, cosmetics and medical products entering the U.S. It is intended to reduce manual paper-handling costs while speeding and improving the clearing process.

Flaherty said a cost/benefit analysis done by a contractor estimated that OASIS would save importers $1.25 billion from 1994 through 2001 from reduced manual effort and faster processing.

A pilot version of OASIS was installed in Seattle in 1992, and more pieces of the system were rolled out at other ports in 1993 and 1994. But last year, an internal FDA probe found OASIS "at a high risk of failure" and recommended suspension of the project until a thorough review was conducted.

Flaherty said the first of two major pieces of OASIS is now running well at all 250 ports where the FDA operates. He said the second component will be deployed in phases beginning next August. Total development costs from 1987 through 2001, which include several years of maintenance, will be $36 million, he said.

Only some of the deficiencies discovered in the internal review were corrected, said Frank Reilly, a director at the GAO's Accounting and Information Management Division.

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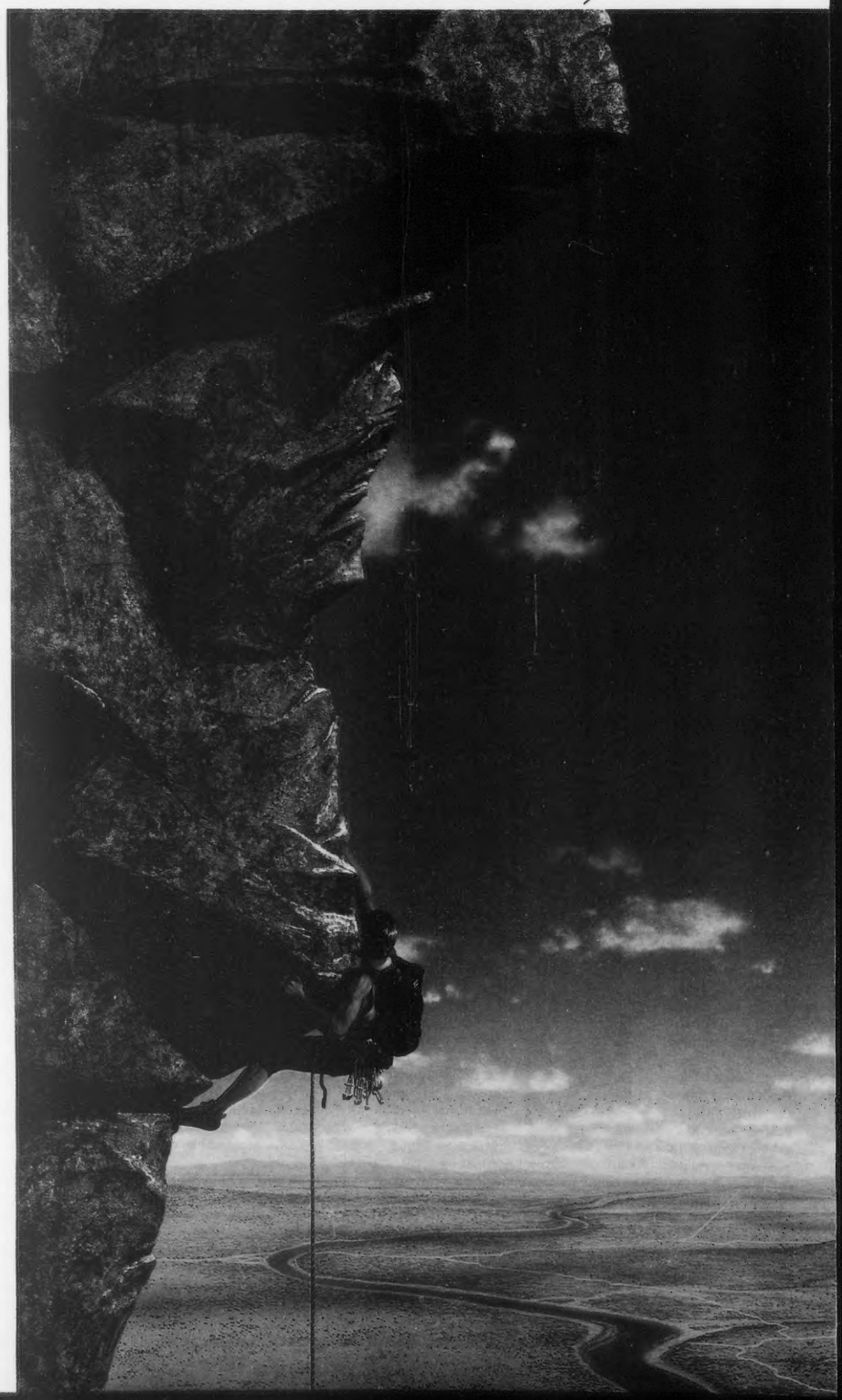

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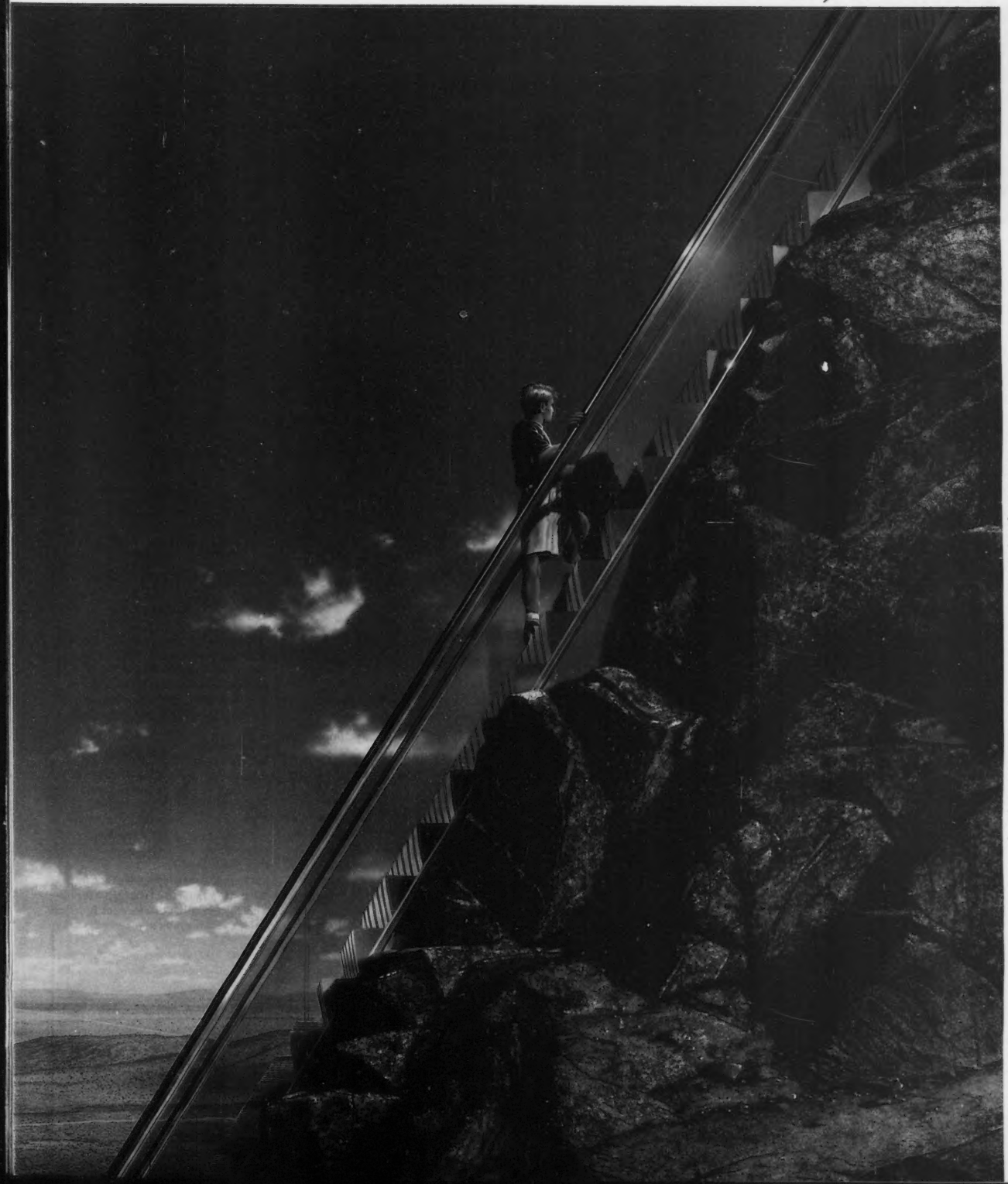

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Tools help solve crash mysteries

CONTINUED FROM PAGE 89

logs each keystroke and mouse click a user makes when using Unix software. The system stores the information in a log file that is electronically mailed to support personnel if the application crashes, said the Wall Street user, who has tested QC/Recall but asked not to be identified.

Developers can use the log to identify immediate workarounds for problems by spotting a sequence of keystrokes or mouse clicks that trigger a problem, then replaying the log within a debugger to track down and correct bugs, he said.

QC/Recall will ship in December for workstations from Sun Microsystems, Inc. and Hewlett-Packard Co.

Software diagnostics

Pure Software, Inc. in Sunnyvale, Calif., began shipping PureVision, a similar product for Sun workstations, in September. Pure and Centerline both plan to support additional Unix platforms next year, and Pure also plans a version for Microsoft Corp.'s Windows NT.

Prices are high for the logging software. A 15-user bundle from Centerline is $25,000, and one from Pure costs $47,500.

But without these software packages, or something like them, it is nearly impossible to track down many problems in ever-more complex client/server applications, analysts said.

"The whole area of distributed support and how we keep these distributed systems running is critical," said Hugh Bishop, an analyst at Aberdeen Group, Inc. in Boston. "This has a tremendous amount of potential to help."

Developers can also use the log information to identify which software features are used and how, analysts said.

"You can learn an awful lot from what's going on in the field, and without tools like this, you lose a lot of it," said Dick Heiman, a senior analyst for application development at International Data Corp. in Framingham, Mass.

But for the moment, that kind of information is available only for Unix. Still lacking is a good system for tracking user actions on PCs under Windows. Windows 3.1 and NT include a utility called Dr. Watson to log the system's state in case of a crash. But few PCs have the resources to spare to log what is going on without dragging down system performance, analysts said.

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Gerber

CONTINUED FROM PAGE 89

ronment, so you don't have to keep reinventing the wheel. But too many components could be confusing and tedious for developers and end users to deal with compared with the five applications integrated under a common interface in a suite.

The popularity of suites indicates that users want application integration, not disintegration. It also shows they like to have application decisions made for them. They don't even care if it's the absolute best application for each function, as long as the application does the basic job.

The popularity of suites indicates that users want application integration, not disintegration.

So when I read things about the new age of software components, I think it's like Sir Thomas More's *Utopia* — some fantasy, not Earth in the here and now.

It seems to me that software components are for technical, independent thinkers who have customized systems to provide. Suites are for the majority who are neither technically inclined nor independent thinkers.

Gerber is *Computerworld's* senior editor, PC application software.

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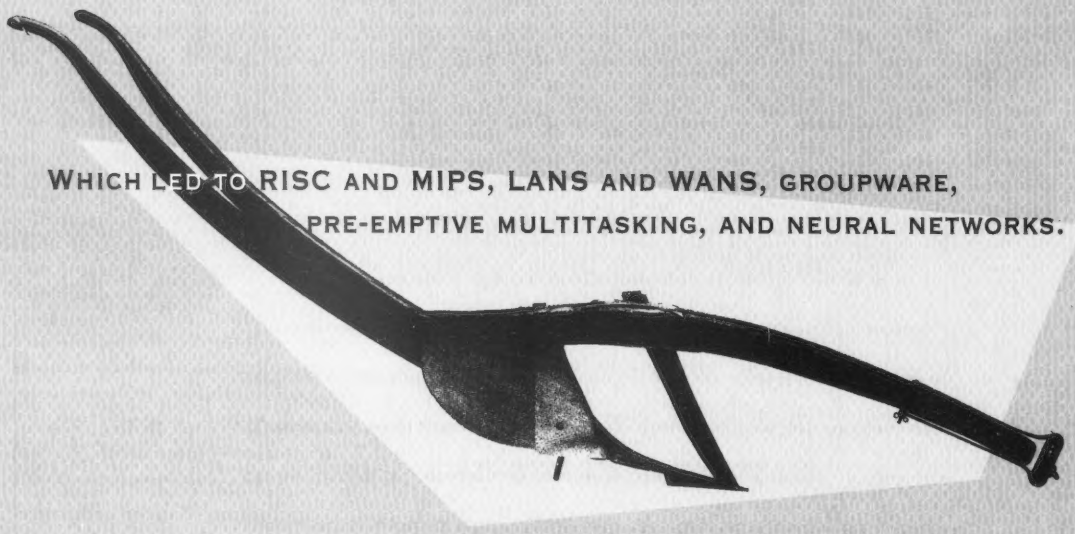

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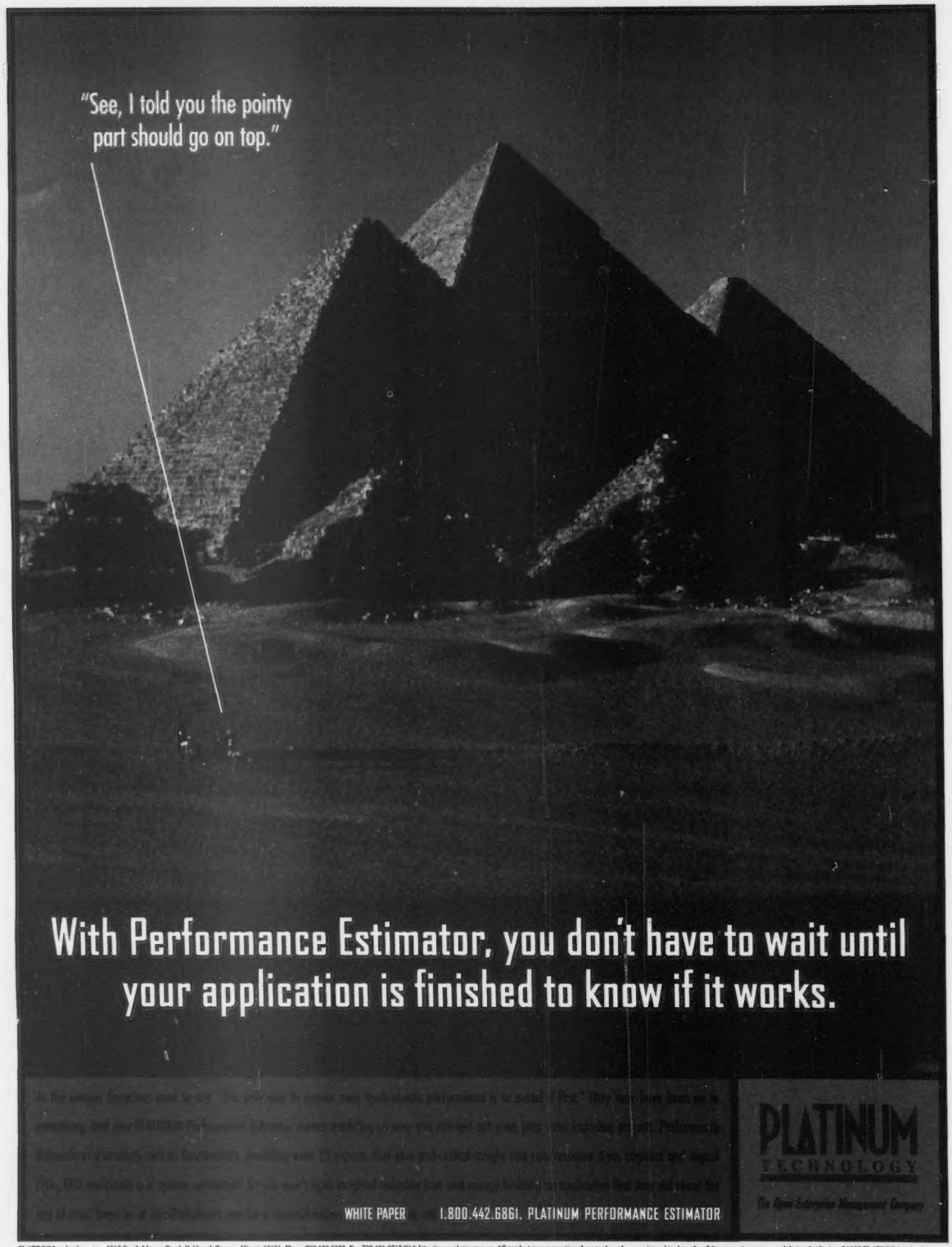

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New Products

Toray Industries, Inc. has announced plans to bundle its Phasewriter Dual drive, a rewritable optical drive and quad-speed CD-ROM reader, with **Horizons Technology, Inc.**'s Open Info Manager multimedia authoring software.

According to the San Mateo, Calif.-based Toray Industries, the combined package will provide Phasewriter Dual drive users with a multimedia authoring, optical storage and publishing package. It gives users a construction tool for interactive multimedia applications.

The package is a framework for integrating and managing the many elements required to build multimedia presentations and projects, without requiring users to learn complex programming or scripting languages.

The bundle costs $750.

▶ *Toray Industries*
(415) 341-7152

Objects, Inc. has announced Layout 4.0 for Windows, an object-oriented application development tool.

According to the Danvers, Mass., company, Layout 4.0 for Windows lets users build complete applications without using a traditional computer language. It lets users graphically manipulate on-screen objects to create a diagram that represents the program. The product then uses the diagram to create ready-to-run .EXE files.

Layout 4.0 features an upgraded interface, enhanced card design features and enhanced OLE support. It provides direct access to the advanced features of Windows including OLE 2.01 and Dynamic Data Exchange.

Layout 4.0 costs $100.

▶ *Objects*
(508) 777-2800

Visual Components, Inc. has introduced Visual CodeBank and Visual SourceWorks, two new products for Microsoft Corp. Visual Basic 4.0 developers.

According to the Lexena, Kan., company, Visual CodeBank is a code library manager containing a large collection of royalty-free Visual Basic functions and subroutines. Visual SourceWorks is a source control product to help Visual Basic developers manage products.

The Visual CodeBank code library includes functions and subroutines to handle database operations, graphics, multimedia, effects, sorts, optimization, security and text. It was designed to let developers enhance the performance of their applications with control replacement functions and subroutines. It also lets users accelerate form loading using functions to create tabs, outlines, picture buttons, panels and labels.

Visual SourceWorks includes a user interface that emulates Microsoft's Windows Explorer. It includes support for private puts, expanded systems administrator and user identity controls, new checks for existing projects and project tracking with support for complex structures of folders and subfolders.

Visual CodeBank costs $149; Visual SourceWorks costs $249.

▶ *Visual Components*
(913) 599-6500

Wild Hare Computer Systems, Inc. has announced Wild Hare ODBC Personality Module, an Open Database Connectivity (ODBC) interface for ICobol and VS Cobol environments.

According to the Boulder, Colo., company, Wild Hare ODBC Personality Module allows applications written in Data General Corp.'s ICobol and VS Cobol using Wild Hare's Choice Cobol runtime system to access any ODBC-compliant relational database.

The product lets DG's Cobol applications directly access relational database management systems in a full range of environments. This function allows users to replace their proprietary legacy file systems with a relational database on Unix.

In addition to the Personality Module, users need the appropriate ODBC driver for the intended relational database.

Pricing for Wild Hare ODBC Personality Module starts at $350 for a single-user PC.

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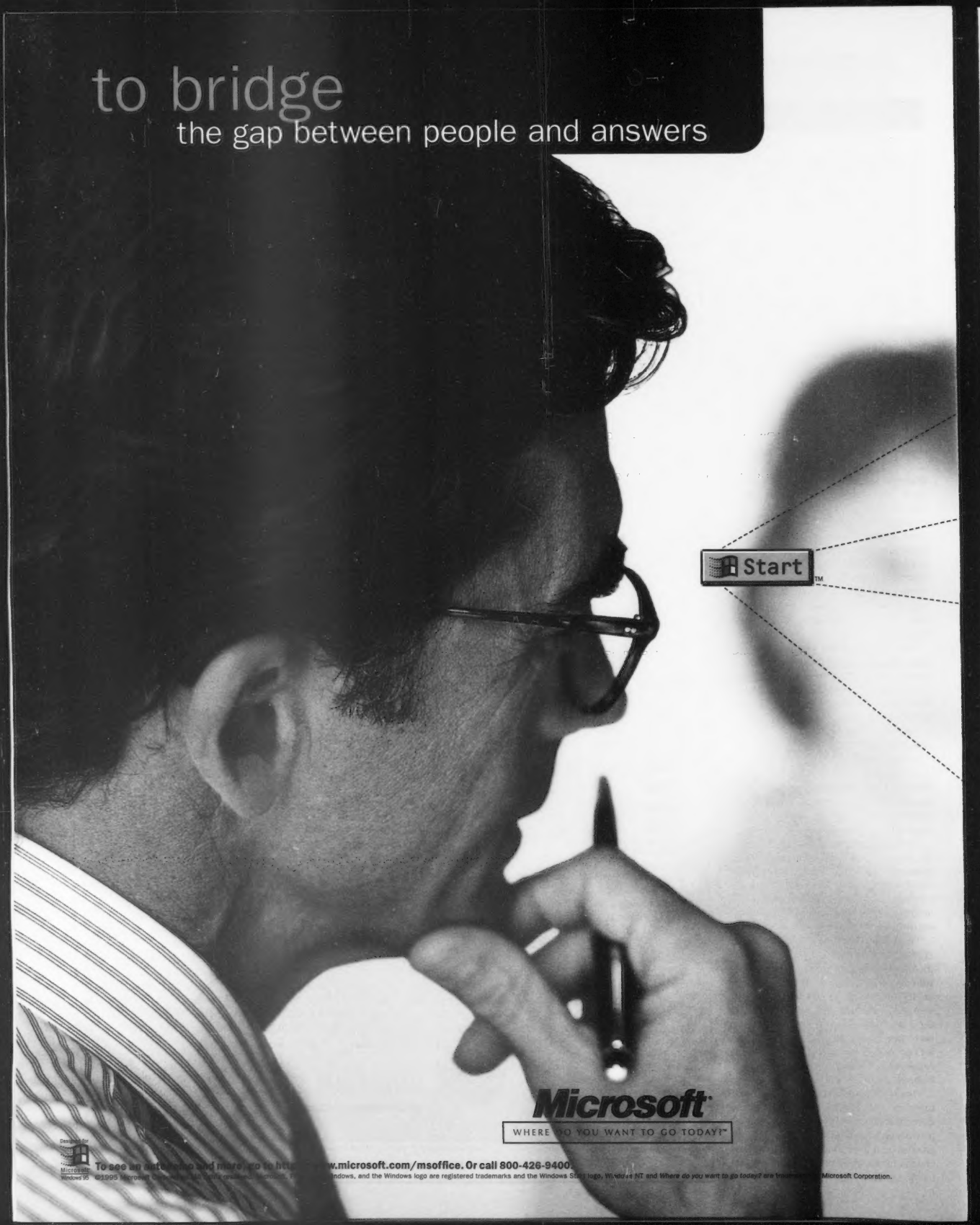
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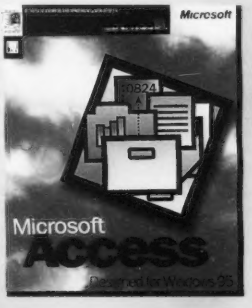
Gathering information becomes intuitive so work flows without interruption. Microsoft Access makes it easy for people to find data from various sources throughout your company's system. With Open Database Connectivity (ODBC), users can pull together data from a variety of databases, providing new insights into existing corporate data. Once data is available, the new Filter by Selection function finds answers promptly, without complex queries, and work moves quickly toward completion. And, since the next generation of Wizards can take both new and experienced users step-by-step through tasks ranging in difficulty, there's never anything standing between your people and the answers they need.

Give people the tools to set their data in motion. Now that finding information is quick and easy, users can spend more time turning it into real business solutions. New Microsoft Access works seamlessly with the Microsoft Office family of applications. Familiar tools, like the Answer Wizard, mean users spend less time getting started, so your company saves time and money. People have the capability to take analysis another step by using Microsoft Excel PivotTable® views to see the names and numbers retrieved by Microsoft Access in a clear and dynamic way. And with the Microsoft Word Mail Merge Wizard, users can combine data like names and addresses with documents. They just select the data to merge, the document to mail, and Microsoft Access sets everything up to go.



Now your company can take full advantage of database technology. New Microsoft Access is the desktop database designed to work with the Windows® 95 operating system and the powerful capabilities of Windows NT™ Workstation. With the introduction of Database Replication, people have the capability to take work on the road using the Windows 95 Briefcase and merge offline changes when they return. With new Microsoft Access you can bring the information your people need to their fingertips. Help them find answers. Help them use their software without it getting in the way.

Management: Special Report

SKILLS SURVEY

GOOD HELP GETS

IS departments face one of the most serious skills shortages in recent memory. Companies are stealing each other's best people and bidding salaries up in the process. What are the options?

By Brian McWilliams

With an information systems force of 800, you wouldn't expect Baxter International, Inc. to find itself shorthanded very often.

But Kathy Brittain White, chief information officer of the $9.3 billion, Deerfield, Ill.-based hospital supply company, relies heavily on consultants to staff Baxter's SAP R/3 project.

"We'd like to keep this work inside," she says, "but there's a huge void of people skilled in that area."

Demand for skills such as SAP is running well ahead of supply in a number of new technologies, according to the exclusive *Computerworld* IS Skills Survey. Programmers proficient in hot areas such as object-oriented programming, relational databases and client/server application development are highly sought after in every industry and region of the country.

"I haven't seen a seller's market like this since the last big paradigm shift 25 years ago, when everyone began moving to on-line computing," says Stuart Orr, vice president of IS at Callaway Golf Co., a Carlsbad, Calif.-based manufacturer of golf clubs.

Stoked by a strong economy and the mass movement to client/server, today's white-hot market is driving up salaries for programmers with in-demand skills.

Many of the nearly 1,200 IS managers surveyed by *Computerworld* this summer report they are paying sizable salary premiums — in some cases, more than 35% — to hire and retain talent.

SAP programmers are at the top of the pay scale. According to the survey, they command salaries that are 17% higher on average than other IS staff in the same organization. That figure is nearly double the average premium paid for other hot skills such as NextStep (9.5%), Smalltalk (9.3%) and Dynasty (8.8%) but may actually be a low estimate, according to some executives.

"Seventeen percent is bunk," says Mike Johnson, president of Texas Triple-I, Inc., an SAP consulting firm based in Houston.

He reports that Triple-I pays $150,000 and up for programmers experienced in R/3. Johnson says Triple-I's employees, many of them recent recruits from the Pacific Rim and Europe, get calls every day from headhunters. "These guys know what they are worth. It's a simple issue of supply and demand," he says.

The skills shortage has been good financially for some developers, but technology executives say it may threaten the overall health of their organizations.

Even at many of the best IS shops, turnover rates are rising, which some managers attribute to an increasingly mercenary streak in talented programmers.

"We've lost some very good people in the last couple of months," says Jim Kinney, chief information officer at Kraft General Foods, Inc., a division of Philip Morris Cos. "You try to build a culture that people want to be part of, but it's hard when someone else is offering them a 30% jump in salary."

Free agents

Many IS heads accept such free agency as part of the new social contract between programmers and their employers, says Steve McMahan, managing director at the Boston office of Source EDP, an IS placement and consulting firm. But problems arise when the talent shortage reverberates outside the IS group.

"In the past month alone," McMahan reports, "two large companies have told me they have had multimillion-dollar client/server projects held up at the dock be-

The Top 20 hottest skills

(Ranked according to the size of the premium above base salary that companies are willing to pay for the skill)

	SKILL	PREMIUM WILLING TO PAY	MAINSTREAM OR NICHE SKILL
1.	SAP	17.1%	Niche
2.	NextStep	9.5%	Niche
3.	Smalltalk	9.3%	Niche
4.	Dynasty	8.8%	Niche
5.	Objective-C	8.8%	Niche
6.	Gupta SQLBase	8.7%	Niche
7.	Oracle (applications)	8.5%	Mainstream
8.	Sybase (RDBMS)	8.5%	Mainstream
9.	Oracle (RDBMS)	8.3%	Mainstream
10.	PeopleSoft	8.3%	Niche
11.	PowerBuilder	8.5%	Mainstream
12.	Oracle CDE	7.6%	Mainstream
13.	JYACC JAM	7.6%	Niche
14.	Gupta SQLWindows	7.2%	Niche
15.	CA Ingres	7.2%	Niche
16.	Banyan Vines	7.2%	Niche
17.	Lotus Notes	7.1%	Mainstream
18.	C++	6.7%	Mainstream
19.	WordPerfect Symmetry	6.5%	Niche
20.	Solaris	6.4%	Niche

Note: Mainstream skills are skills that 10% or more of respondents mentioned as being necessary. Niche skills were mentioned by less than 10% of respondents.

Source: Exclusive 1995 *Computerworld* Skills Survey

SKILLS SURVEY

HARDER TO FIND

cause of staffing problems."

The skills gap hasn't directly affected service so far, but it's forcing IS executives to spend more time on personnel matters such as hiring, training and retention.

Callaway Golf, a growing firm with many attractions for job candidates including an oceanside location in southern California, proves that no company is immune to the economics of supply and demand. Orr says he needs to double his staff to pull off Callaway's major client/server initiative, but he is finding it difficult to fill many of the slots.

"I've had an open [request] for an Oracle database administrator for four months now," Orr says. "I knew the market was tough, but I really didn't expect we'd have this much difficulty."

Up to par

The tough hiring market couldn't come at a worse time for those businesses in the throes of re-engineering.

The pharmaceutical industry, in particular, is feeling the crunch. Information technology organizations in that field are under pressure to link global networks and build systems required by market changes such as managed care, according to Polly Moore. Moore is vice president of information resources at Genentech, Inc. in southern San Francisco.

"Our projects today are massive compared to five or 10 years ago," she says, "so we are extremely dependent on good people."

Other drugmakers apparently share that outlook. The industry

Skills survey, *page 102*

ANDY FREEBERG

"Our projects today are massive compared to five or 10 years ago, so we are extremely dependent on good people."

— Polly Moore, vice president, information resources, Genentech

SAP shortage: No relief in sight

The pool of SAP-certified consultants is growing 40% annually, according to SAP AG, but that isn't enough to satisfy skyrocketing demand. "Things will get worse before they get better," predicts Vinnie Mirchandani, an analyst at Gartner Group, Inc. in Stamford, Conn.

German-based SAP sold $1 billion worth of licenses in 1994. Those new implementation projects, combined with the maintenance work required on an estimated 3,200-plus "live" SAP installations, are keeping recruiters and SAP trainers busy.

With salaries for SAP consultants at six figures, many IS managers wonder when the pendulum of supply and demand will swing back in their favor. "It will be two years before supply catches up to demand," predicts Rob Wojczyk, an account executive at Expertise Plus, a recruitment firm in Northampton, Mass., that specializes in SAP.

The number of consultants with knowledge of SAP is approaching 18,000 worldwide, Mirchandani says. More than 8,600 SAP-certified consultants are employed by SAP, the Big 6 consulting firms and hardware vendors, according to market researcher Dataquest, Inc. in Westboro, Mass. Consulting firms expect to double their staffs in the coming year.

Even if the SAP talent gap narrows, the application's instability is expected to complicate matters. "SAP as a product is still a moving target," Mirchandani says. He predicts the current crop of SAP consultants will need to upgrade their skills when R/3 Version 3.0 is released sometime early next year.

—Brian McWilliams

How many SAP-certified consultants do you have worldwide?

Andersen Consulting	3,000
IBM	1,500
Price Waterhouse	1,150
ICS, Deloitte & Touche	1,000
Coopers & Lybrand	665
Ernst & Young	660
KPMG Peat Marwick	320
Hewlett-Packard	320

Source: Dataquest, Inc. survey

Who's paying the highest SAP premiums?

(Ranked according to the size of the premium above base salary that companies are willing to pay for the skill)

BY REGION	PREMIUM
South	22.7%
West	15.4%
Northeast	14.1%
Midwest	12.8%

	THE TOP 5 INDUSTRIES	PREMIUM
1.	Government	31%
2.	Finance	30%
3.	Education	28%
4.	Computers	25%
5.	Health care	24%

NATIONAL AVERAGE	17.1%

Source: Exclusive 1995 *Computerworld* Skills Survey

SKILLS SURVEY

CONTINUED FROM PAGE 101

has bid up prices for programmers proficient in nearly all of the 65 skills listed in the *Computerworld* survey. And for some skills, including OSF/1, NextStep, Dynasty, Gupta Corp.'s SQLBase and Banyan Systems, Inc.'s Vines, salary premiums for the industry average more than 30%.

Moore says her Unix systems programmers are especially critical. "These are extremely talented people who could go anywhere they wanted. I'd hate to try to replace them in this market. It would probably take us six months."

She says she hasn't had many defections in recent years, thanks in part to competitive salaries and employee perks that include leased lines to programmers' homes.

But the industry's IS shops, in general, have fallen off the pace, according to Mark Delfino, a vice president of Boston Consulting Group's information technology practice in Chicago.

He says the premiums that pharmaceutical firms are paying over their usual IS salaries merely bring them up to market rates. "Their baseline is lower, so they are paying more now to upgrade their talent," Delfino explains.

Not every drug company is willing, or able, to break the bank to hire hotshot programming talent. For example, the information technology budget at Upjohn Co. has been frozen for three years due to competitive pressures. And training and development spending has been cut "drastically," according to Kathy Kostzrewa, director of enterprise information technology management at the Kalamazoo, Mich.-based company.

"Our strategy now is to buy packages and use IS staff as architects and integrators. People who want to do heads-down coding will have to go elsewhere," she says.

Weathering the storm

Hundreds of Texas programmers had to do just that in the late 1980s, when the state's oil-induced recession forced many businesses to make deep cuts in IS staff.

The situation looked dire for recruiters such as Mike Varrichio, branch manager of Source EDP in Dallas. "Business didn't dry up and blow away, but some days it felt like it might," he says.

The Texas economy is more diverse and booming today, partly due to an influx of telecommunications and transportation firms.

The state also boasts one of the hottest IS job markets in the country, according to *Computerworld*'s survey. For example, IS managers in Dallas report paying double-digit salary premiums for two dozen skills and premiums in excess of 30% for SQLBase, Computer Associates' Ingres, Progress and SAP.

MICHAEL ABRAMSON

"You try to build a culture that people want to be part of, but it's hard when someone else is offering them a 30% jump in salary."

— Jim Kinney, chief information officer, Kraft General Foods

Varrichio also has changed his tune: "I've got the best job at Source," he says.

But while the good times are rolling for recruiters, some IS managers say salaries must come back to earth soon. Orr says he worries that the lofty take-home pay of some staffers may look out of proportion when compared with the rest of the company.

"People here are willing to concede that [information technology] is strategic, but is it more important than golf clubs?" he asks.

Rick Leif, vice president of information services at Allmerica Property and Casualty Cos. in Worcester, Mass., says his goal is to ride out the hiring storm with his staff more or less intact.

His thinking: Technologies come and go, so it is better to build internal skills than chase outside talent. "In the long term, having a staff of Cobol programmers isn't good for a company or its employees," Leif says.

To satisfy individuals' desire to remain professionally viable and maintain the department's productivity, Leif has outsourced grunt-level Cobol coding and saved the C and C++ application design for retrained employees.

But retraining can be a double-edged sword. Turn Cobol programmers into client/server experts and you immediately make them the target of recruiters.

Kinney recently sent five top employees through SAP training and watched one of them walk out the door when Kraft decided to cancel its plans for a full-blown SAP proj-

Skills survey, *page 105*

South leads the nation in skills demand . . .

BY REGION	DATABASE SKILLS	LANGUAGES	DEVELOPMENT TOOLS
South	8.9%	9.0%	8.1%
Northeast	7.8%	6.8%	6.9%
West	5.5%	6.6%	8.1%
Midwest	5.9%	4.9%	8.1%

. . . especially in the West South Central region

BY REGION	DATABASE SKILLS	LANGUAGES	DEVELOPMENT TOOLS
West South Central*	15.8%	10.9%	11.6%

*West South Central includes Texas, Arkansas, Oklahoma and Louisiana

(Ranked according to the size of the premium above base salary that companies are willing to pay for the skill)

NOTE: **Database skills** include DB2, Gupta SQLBase, Informix, CA Ingres, Oracle, Progress, Sybase, PC databases. **Languages** include C, C++, MicroFocus Cobol, Smalltalk, Objective-C. **Development tools** include Dynasty, Forte, Gupta SQLWindows, JYACC JAM, NextStep, Oracle CDE, PowerBuilder, Visual Basic, Uniface.

Source: Exclusive 1995 *Computerworld* Skills Survey

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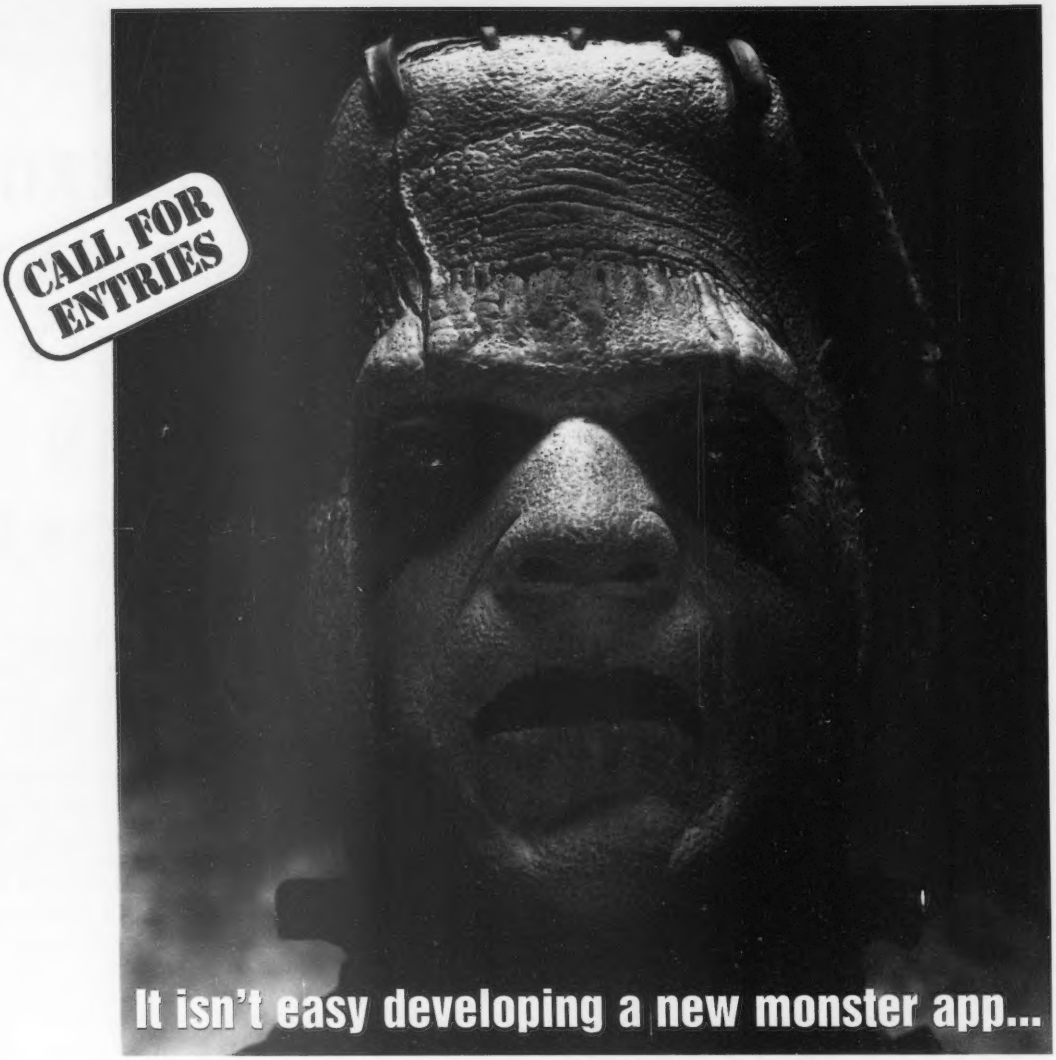

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SKILLS SURVEY

CONTINUED FROM PAGE 102

ect. "Just because you provide training to employees doesn't mean they're indentured servants," Kinney says. But you do expect some kind of a commitment, he adds.

Kinney says Kraft is developing a post-training retention agreement. The plan would require IS employees to remain with the company for six months after they are trained in SAP or other highly marketable skills. Earlier departures would require the employee to reimburse the company for the training. To put a positive spin on the plan, Kraft will pay a bonus to staffers who stick to the agreement beyond the retention period.

With companies going to new lengths to find and retain top IS pros, it is tempting for programmers to get overly sanguine. But "periods of talent scarcity can quickly be followed by gluts. So don't fall in love with your resume," McMahan counsels.

Two years ago, the shortage of PowerBuilder developers was so bad it hurt sales, according to Maria Morrissey, director of professional services at Powersoft in Cambridge, Mass. "Developers saw the writing on the wall and got retrained. Today the demand is still strong, but the supply is starting to catch up," Morrissey says.

Still, it's hard to deny that these are great times to be a software professional. Just how good are they? Programming guru Ed Yourdon, author of the pessimistic book *Decline and Fall of the American Programmer* in 1991, is at work on a sequel (a draft of which is available on the World Wide Web at http://www.acm.org/yourdon).

The working title of the book, which will be published by Prentice-Hall next spring, says it all: *Rise and Resurrection of the American Programmer.* ■

McWilliams is a freelance writer in Durham, N.H.

In the networking wars, NT pays a higher premium

SKILL	PREMIUM
Windows NT Server	6.1%
Novell NetWare	5.5%

(Premium refers to the percent above base salary that companies are willing to pay for the skill.)

Source: Exclusive 1995 *Computerworld* Skills Survey

Opportunities on the electronic frontier

Hiring demand for 'net experts is still low . . .

SKILL	CURRENT DEMAND	PREMIUM
Internet expert	Low	4.8%
TCP/IP	Low	5.0%

. . . and E-mail skills have become a commodity item . . .

SKILL	CURRENT DEMAND	PREMIUM
Beyond Mail	Low	5.5%
Microsoft Mail	Low	3.9%
CC:Mail	Low	2.8%

. . . but groupware shows signs of life

SKILL	CURRENT DEMAND	PREMIUM
Lotus Notes	Medium	7.1%
WordPerfect Symmetry	Low	6.5%

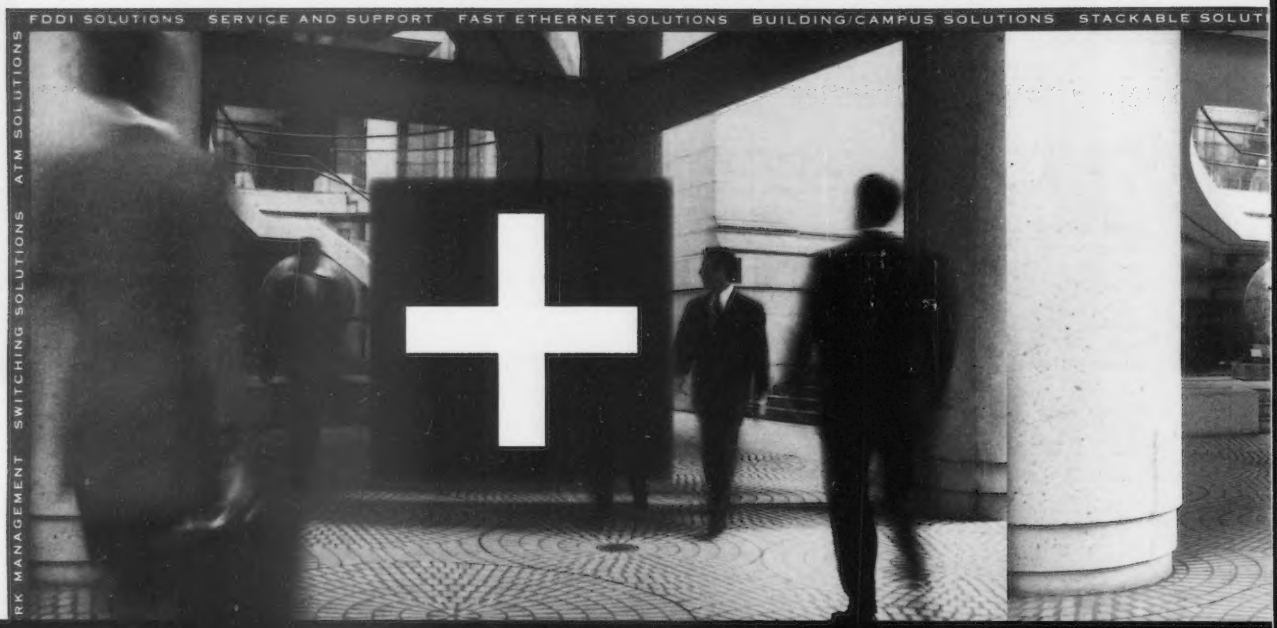
(Premium refers to the percent above base salary that companies are willing to pay for the skill)

Source: Exclusive 1995 *Computerworld* Skills Survey

What's hot, what's not

CATEGORY	PREMIUM (Mean)	CURRENT DEMAND	MAINSTREAM OR NICHE MARKET
LANGUAGES			
Smalltalk	9.3%	High	Niche
Objective-C	8.8%	Medium	Niche
C++	6.7%	High	Mainstream
C	5.1%	High	Mainstream
MicroFocus Cobol	5.1%	Medium	Mainstream
DEVELOPMENT TOOLS			
NextStep	9.5%	Low	Niche
Dynasty	8.8%	Low	Niche
PowerBuilder	8.3%	High	Mainstream
Oracle Developer 2000	7.6%	High	Mainstream
JYACC JAM	7.6%	Medium	Niche
Gupta SQLWindows	7.2%	High	Niche
Visual Basic	5.3%	High	Mainstream
Uniface	5.1%	Medium	Niche
Forte	4.6%	Low	Niche
OPERATING SYSTEMS			
Solaris	6.4%	High	Niche
Windows NT Workstation	6.0%	High	Mainstream
OSF/1	5.4%	Low	Niche
HP-UX	5.2%	High	Mainstream
AIX	5.1%	High	Mainstream
OS/2	4.5%	Medium	Mainstream
MVS	4.4%	High	Mainstream
DEC VMS	4.1%	Low	Mainstream
Apple System 7.5	3.9%	Low	Niche
Windows	3.1%	Medium	Mainstream
DOS	1.8%	Low	Mainstream
NETWORKING			
X.25	5.1%	Medium	Mainstream
TCP/IP	5.0%	Medium	Mainstream
LU6.2	4.5%	Low	Mainstream
APPC	4.5%	Low	Niche
INTERNETWORKING			
Bay Networks	5.1%	Medium	Niche
Cisco	4.5%	Low	Mainstream
3Com	4.4%	Low	Mainstream
IBM	4.3%	Low	Mainstream
Cabletron	3.4%	Low	Mainstream
NOS LAN ADMINISTRATION			
Banyan Vines	7.2%	Medium	Niche
Windows NT Server	6.1%	Medium	Mainstream
IBM LAN Server	5.5%	Medium	Mainstream
Novell NetWare	5.5%	Medium	Mainstream
Pathworks (DEC)	5.5%	Low	Niche
AppleTalk	2.6%	Low	Niche
RDBMS ADMINISTRATION			
Gupta SQLBase	8.7%	Medium	Niche
Sybase	8.5%	High	Mainstream
Oracle	8.3%	High	Mainstream
CA Ingres	7.2%	Medium	Niche
Progress	6.4%	Medium	Niche
DB2	5.9%	High	Mainstream
Informix	5.7%	Medium	Niche
PC databases	3.8%	Low	Mainstream
OFFICE/E-MAIL			
Lotus Notes	7.1%	Medium	Mainstream
WordPerfect Symmetry	6.5%	Low	Niche
Beyond Mail	5.5%	Low	Niche
CC:Mail	3.9%	Low	Mainstream
Microsoft Mail	2.8%	Low	Mainstream
APPLICATIONS			
SAP	17.1%	High	Niche
Oracle	8.5%	High	Mainstream
PeopleSoft	8.3%	High	Niche
Dun & Bradstreet	4.5%	Low	Niche
SYSTEMS MANAGEMENT AND SUPPORT			
Decision-support systems	6.2%	Medium	Niche
OLTP	6.0%	Low	Niche
Network management	5.9%	Medium	Mainstream
Project management	5.7%	Medium	Mainstream
Capacity planning, utilization and performance	5.3%	Low	Mainstream
Internet expertise	4.8%	Low	Mainstream
Security	4.5%	Low	Mainstream
Desktop/Help desk support	3.2%	Medium	Mainstream

Source: Exclusive 1995 *Computerworld* Skills Survey of 1,200 CIOs, IS directors and IS managers



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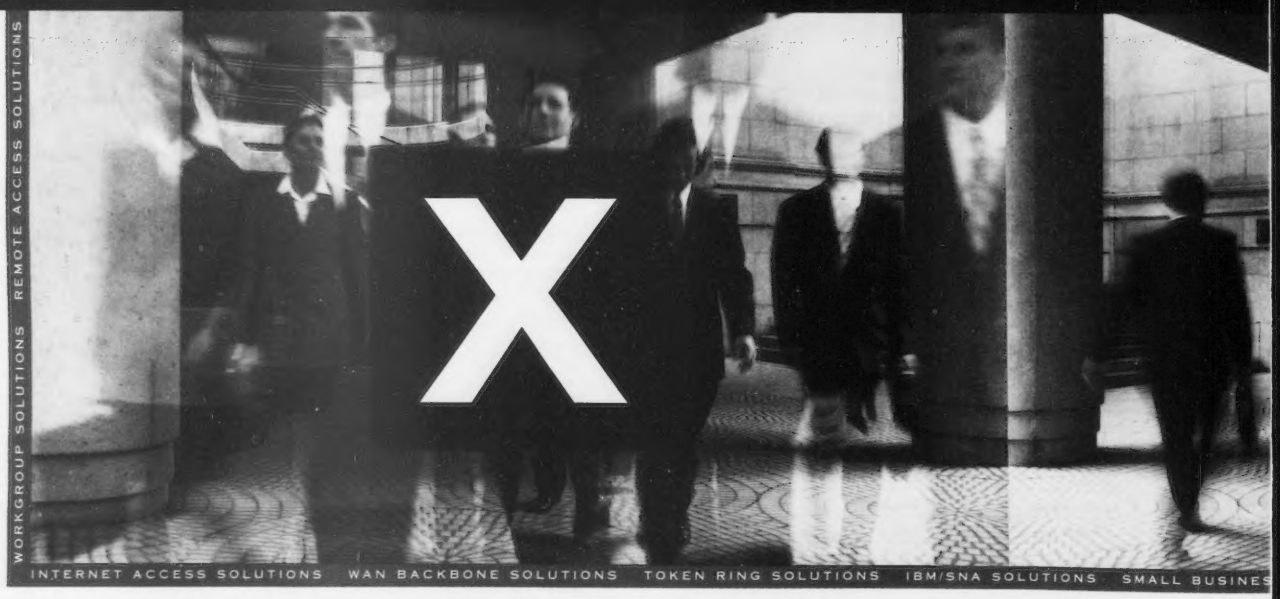

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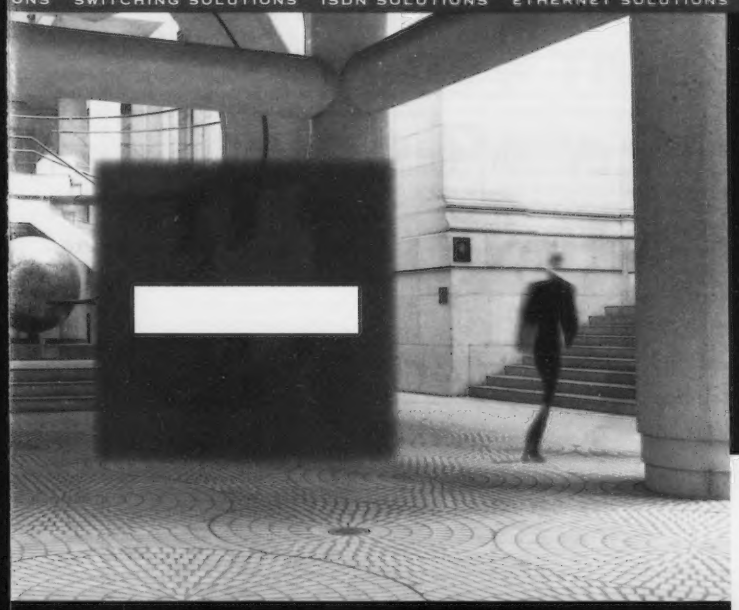

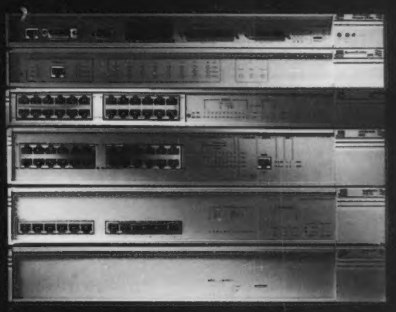

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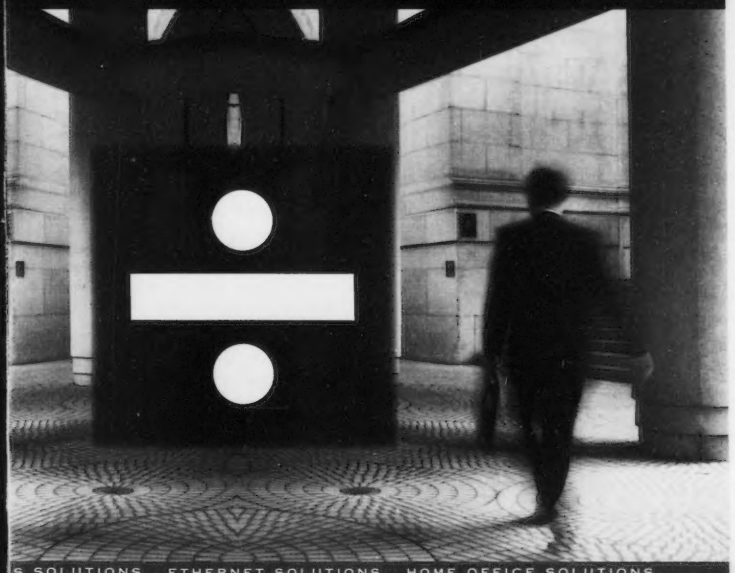

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DEC. 2 - 8

MANAGEMENT

The Program on Negotiation for Senior Executives. Cambridge, Mass., **Dec. 4-6** — This program isn't specific to information systems, but it can help IS executives sharpen their negotiation skills. Faculty are from Harvard University and other major Boston-area universities. Topics include "Setting the Stage for Productive Negotiations," "Building Successful Relationships: Overcoming People Problems" and "Dealing with Differences: Managing the Negotiation." Fee: $1,275 to $1,950. Programs will also be offered March 18-19, April 22-23 and June 3-4. Contact: Julie Dunbar, Center for Management Research, Wellesley, Mass. (617) 239-1111.

Managing Intellectual Capital Strategically. New York, **Dec. 7-8** — Speakers include Vincent Barabba, author and general manager of General Motors Corp.'s Strategic Decision Center. Topics include "Valuing your Intellectual Assets Appropriately," "Building a Knowledge Underground," "Building and Leveraging Customer Knowledge," "Practical Strategies for Leveraging Intellectual Capital" and "Leveraging Technology for Intellectual Capital Formation and Investment." Fee: $1,195. Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

INDUSTRIES

The Rise of Home Banking & Electronic Commerce. Washington, **Dec. 5-6** — The conference will analyze trends in home banking and electronic commerce and how to prepare for the changes they will bring. Fee: $295 (early), $345 (regular). Contact: Michael F. Cavanagh, Cavanagh Associates, Arlington, Va. (703) 875-8666.

CreaTech/Hollyweb: The Interactive Advertising and Marketing Conference. Beverly Hills, Calif., **Dec. 6-7** — The conference is geared toward advertising, marketing, Internet and multimedia developer communities. Sessions include "Branding in Cyberspace," "Profit Models in the New Media," "Research and Cyberspace," "Web Technology for Agencies" and "Web Case Studies." Contact: TechMarketing, Inc., Scarsdale, New York (914) 723-4464.

Medical Records Institute Fall Developers Conference. Boston, **Dec. 7-8** — Workshops on electronic patient medical records are aimed at developers and implementers of these systems. Contact: Medical Records Institute, Newton, Mass. (617) 964-3923.

USER GROUPS

DECUS '95. San Francisco, **Dec. 2-7** — Sponsored by the Digital Equipment Computer Users Society (DECUS). The event features seminars, symposiums, demonstrations of Digital Equipment Corp. technology and a trade show. This year's event will have a special focus on Microsoft Corp.'s Windows NT, OpenVMS, Linux and Digital's Unix. Contact: DECUS Customer Service, (800) DEC-US55.

TECHNOLOGIES

Client/Server '95. Orlando, Fla., **Dec. 4-7** — The event will focus on the security and control concerns surrounding client/server architectures and the management practices that best address this decentralized operating environment. Contact: Pam Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

DB/Expo '95. New York, **Dec. 4-8** — The event will focus on database, client/server and networking technology. Contact: Blenheim NDN, Inc., Mountain View, Calif. (800) 232-3976.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

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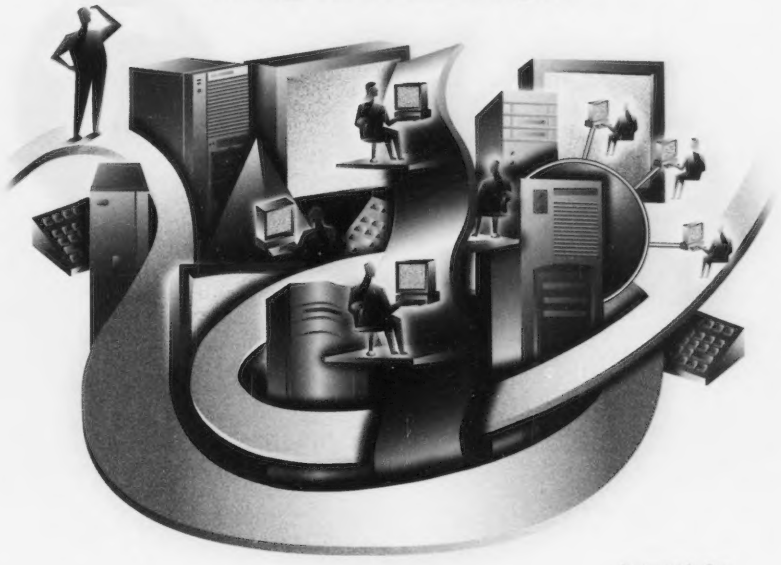
The CW Guide to High-end Desktop PCs

Finding peace in PC purchasing

Don't get bogged down chasing the fastest systems. Instead, understand your user base, set minimum technology standards and think long term.



ILLUSTRATIONS BY JOHN BLECK

BY ROSEMARY CAFASSO

Buying desktop PCs can be a nightmare. End-user productivity rides on what you decide. Your choice could even impact the company's bottom line. As the chips get faster and more powerful, you struggle to find the best technology with the meager budget you've been given. Then, just when your supposedly state-of-the-art PCs are delivered, some other supplier rolls out a PC with a processor that will run rings around yours. Guess what? You lose again.

But many information systems executives and industry analysts now say it doesn't have to be so ugly. Buying PCs can be a relatively painless task as long as you treat it like a business operation and stop focusing on the constantly changing technology.

"The single most important point is there is a lot more to this than chips," says Eric Lewis, manager of personal systems research at International Data Corp. in Mountain View, Calif.

Here's how several corporate buyers and industry analysts say PC purchasing is best handled:

• **Put together and keep updating an annual purchasing plan.** Chris Goodhue, an analyst at Gartner

High-end desktop PCs, *page 112*

Advice checklist

What's the No. 1 thing to avoid when buying PCs?

"One of the best ways to stay out of trouble is to let the market flush out the dogs. I would never buy anything just out of the factory."
— Robert Chin, Healthsource

"Don't underbuy. It may look like a good deal, but it isn't. You need a balance between the processor speed, memory and the hard drive. Anytime you try to short one of them, you will run into trouble down the road. The upgrade could be more expensive."
— Bob Typanski, Bayer

Avoid "old technology being masked as new, [such as] 14-in. monitors."
— Steve Kleynhans, analyst, Meta Group, Inc.

"If you are afraid of obsolescence, then don't buy older technology to save $300 or $400."
— John Dunkle, Workgroup Strategic Services, Inc.

"If you think your older 486 is going to be adequate for Windows 95, think again."
— Chris Goodhue, Gartner Group

"If you are buying units to be part of a network, make sure they are certified for that network."
— Ralph Petty, operations officer, Pioneer Bancshares

"Don't mix and match types on the network."
— Charles Snowden, manager of marketing IS, Ciba Textile Products Corp.

Inside

Buyers' Advisory Pages
Offers a sneak peek at the future of PCs, recent industry announcements, technical reviews and terms you need to know. Pages 120 and 122.

Buyers' Satisfaction Scorecard
Reveals that users are more concerned with nontechnical issues in their selection of PCs. Page 126.

Firing Line
Four Power Macintosh users say they are pleased with the PC's speed and upgradability, but they admit the operating system needs improvement. Page 128.

Desktop PCs

CONTINUED FROM PAGE 111

Group, Inc. in Stamford, Conn., says the goal should be to "revisit the recommended configurations every six months, but don't be lured into the game of chasing or trailing the technology curve."

Canadian National Railways in Montreal has quarterly reviews, says Ronan McGrath, vice president of information technology and accounting. It has set up a committee to track ongoing requirements and answer questions such as "What are the apps that will require a high-end system?"

"If we have a specific need for an ultra high-speed chip, we will use it," McGrath adds, but "we are not trying to bring in every version of every chip."

• **Create a buying strategy based on a segment of your user base.** Most buyers keep it simple by designating users as entry-level, mainstream or power users. Then buyers use a hand-me-down approach, bringing in top-end systems for very high-end users and shipping their systems to more mainstream users.

Here's how Bayer Corp. in Pittsburgh does it: "The important thing is don't buy PCs that are too small," says Bob Typanski, manager of data access services. "Buy close to the top of the line and then do a two- or three-person swap, with the most powerful system going to your power users."

Currently, Bayer is buying Intel Corp. Pentium-based systems running at 100 MHz for its power users and expects to roll those down to other users during the next five years. Typanski says the 100-MHz Pentium fits the company's goal to buy plenty of power without paying top dollar.

The new Pentium-based systems will go to developers on Typanski's staff, and he says he will get one of their old systems.

• **Buy today what you think your users will need several months or a year from now.** In fact, some analysts suggest projecting out to two years. Corporate buyers say this is the biggest hurdle when purchasing PCs because it is so hard to get a handle on how users will progress and what they will really need. The key, according to IS managers, is to zero in on a few important software issues and then, from those issues, determine the hardware requirements.

For example, ask yourself the following questions: Will users need a multitasking operating environment such as Microsoft Corp.'s Windows 95? If so, work within the high-end Pentium range and make sure systems have at least 16M bytes of memory. Will the company rapidly migrate to true 32-bit software? If so, it's time to pay attention to Pentium Pro. Are there plans for multimedia business applications? If so, stop thinking about components such as CD-ROM drives and speakers as extras.

Healthsource, Inc. in Hookset, N.H., is buying 100-MHz Pentium-based systems even though some users could probably still get by on Intel's 80386-based systems, says Robert Chin, chief information officer. "I don't care how fast you type, your word processing package isn't going to make a Pentium

The big guns

The following are the top high-end PC desktop suppliers as ranked by Computer Intelligence InfoCorp in La Jolla, Calif. Summaries are provided by Matt Sargent, an industry analyst at the firm.

1. Compaq Computer Corp.
Houston, Texas
(800) 345-1518
Number of units: 277,259
Summary: Still No. 1, but competition from players such as HP is increasing. Needs to focus on technology and price advantage.

2. Dell Computer Corp.
Austin, Texas
(800) 289-3355
Number of units: 267,555
Summary: Very strong loyalty among customers. Now needs to focus on overseas markets.

3. Gateway 2000, Inc.
North Sioux City, S.D.
(800) 846-2000
Number of units: 230,695
Summary: Expanding rapidly. Needs a good strategy to compete with Dell overseas.

4. Digital Equipment Corp.
Maynard, Mass
(800) 642-4532
Number of units: 197,009
Summary: Good technology and support, but distribution strategy needs work.

5. Apple Computer, Inc.
Cupertino, Calif.
(800) 776-2333
Number of units: 146,930
Summary: Supply problems have restricted sales.

6. Packard Bell Electronics, Inc.
West Lake Village, Calif.
(800) 733-5858
Number of units: 119,027
Summary: Must overcome the perceived view that its systems are consumer products and not business tools.

7. IBM PC Co.
Somers, N.Y.
(800) 772-2227 (customer assistance and technical support)
Number of units: 116,772
Summary: Large installed base but must improve customer loyalty. Must focus competitive efforts on Compaq and HP.

8. Hewlett-Packard Co.
Palo Alto, Calif.
(800) 752-0900
Number of units: 112,283
Summary: Needs to maintain price advantage and continue to build on brand name.

9. AT&T Global Information Solutions
Dayton, Ohio
(800) 225-5627
Number of units: 103,996
Summary: Plans to hit the road after huge investment. (The company said in September that it will stop making PCs.)

10. Acer America Corp.
San Jose, Calif.
(800) 733-2237
Number of units: 77,900
Summary: Early into Pentium game but needs to improve customer loyalty.

Source: Computer Intelligence InfoCorp, La Jolla, Calif. Ranking is based on estimated number of units purchased or leased (as opposed to shipped) in 1995 by business users. Estimate is for the full year. Ranking includes only those units that are 75-MHz Pentiums or higher and DX4-class processors or higher. Also includes PowerPC 601, 603-class chips.

Hot boxes/Companies to watch

Micron Electronics, Inc.
Nampa, Idaho
A good, fast box for little cost; leading-edge hot products.
Current hot offering: Micron Pro 200 Magnum Plus. Announced early this month, it incorporates a high-performance motherboard designed to fully exploit the potential of Intel's 200-MHz Pentium Pro processor. The entry-level system starts at $5,599.

Digital Equipment Corp.
Maynard, Mass.
Considered a dark horse. Good combination of technology, service and support.
Current hot offering: Celebris XL 5133. Announced Sept. 25, it has a list price of $4,399. Includes a 133-MHz Pentium processor, 16M bytes of RAM, 256K bytes of burst external cache, a 1G-byte hard drive and Microsoft's Windows NT, Windows for Workgroups or Windows 95.

Hewlett-Packard Co.
Palo Alto, Calif.
Pulling out all the stops. Determined to score big in this market.
Current hot offering: HP Vectra VL4 MT. Announced Oct. 23, it is a minitower family that ranges from a 90- to 133-MHz processor and starts at $2,040. Other features include 8M bytes of RAM, a 1G-byte hard drive and Windows 3.1, Windows for Workgroups or Windows 95.

Dell Computer Corp.
Austin, Texas
Has the products and services; now going more "corporate."
Current hot offering: Dell Optiplex GX family. Introduced Oct. 16, it includes built-in multimedia functions. The high-end, which has a list price of $2,500, includes a 133-MHz Pentium processor, 8M bytes of RAM, a 540M-byte hard drive and Windows for Workgroups or Windows 95.

Gateway 2000, Inc.
North Sioux City, S.D.
Customer-driven model is still compelling.
Current hot offering: P5-133. It costs $2,999 and includes a 133-MHz Pentium processor, 16M bytes of RAM, 256K bytes of pipeline burst cache, a 1G-byte hard drive, a 64-bit graphics card accelerator with 2M bytes of dynamic RAM and Microsoft's Windows 95 or Office 95.

Source: A poll of several market research firms, including International Data Corp., Gartner Group, Meta Group, Computer Intelligence InfoCorp, Dataquest, WorkGroup Technologies and Workgroup Strategic Services

sweat," Chin says. "But a year from now, the Pentium 100 will be the lowest end you can buy." (See Sneak Peek, page 120.)

• **Avoid purchasing strategies that rely too much on upgrading PCs too quickly — even if it looks like a great deal.** Most industry analysts and buyers say it's better to have a little extra horsepower on a user's desk than to run out of steam several months after installation. Joe Pucciarelli, an analyst at Gartner Group, estimates that replacing an existing system with a new one can cost a company a minimum of $500 per unit. And that covers only the physical removal of the old system and installation of the new one.

• **Buy a total package.** Consider hidden costs such as service, support, downtime, upgrades and, eventually, the disposal of the system. Gartner Group estimates that the cost of owning a PC can exceed $40,000 over the span of five years when these additional factors are rolled in.

"It's not the price of the PC that matters as much as the service and support," says Adalena Oliver, a team leader and PC buyer at Tellabs Operations, Inc. in Lisle, Ill.

• **Set a minimum technology standard to minimize choices.** But base it on your company's key issues, not what the market says. For example, Pioneer Bancshares, Inc. in Chattanooga, Tenn., recently set a standard for new purchases — Pentium-based processors running at 75 MHz or higher. This was based on user requirements and the price point of about $2,500, says Ralph Petty, operations officer.

• **Don't get bogged down in nitty-gritty technology debates.** Several buyers say that while the difference in performance between a 120-MHz processor and a 133-MHz processor is evident to some power users, it shouldn't be a deal breaker. If you find an overall package with a 120-MHz processor that is a better deal than a 133-MHz-based system, then go with the 120-MHz system.

• **Keep your options open.** Cary Serif, a vice president and manager of applied technology at Huntington Bancshares, Inc. in Columbus, Ohio, says his firm is turning to leasing options from vendors. He declined to share specifics on his leasing arrangements but says it could be cheaper. More important, "the advantage is not getting saddled with old technology." ■

Cafasso is a freelance writer in Walpole, Mass.

Building PCs from scratch not for everyone

At United Grain Growers Ltd. in Winnipeg, Manitoba, no PC maker is going to set the agenda. Instead, this company builds its own systems.

Guy L. Wood, managing director of IS, United Grain

"We buy the bits, and we put them together," says Guy L. Wood, managing director of IS at United Grain. Wood says this strategy ensures a lower cost per unit on PCs because he isn't paying for packaging or service and support. On average, he says, the company saves about 20% per unit.

This strategy allows United Grain to configure a system precisely as it sees fit. "We dictate what components go into it," Wood adds.

Currently, the typical configuration includes a 66-MHz Intel I486-based processor with 8M bytes of RAM and a 500M-byte hard drive.

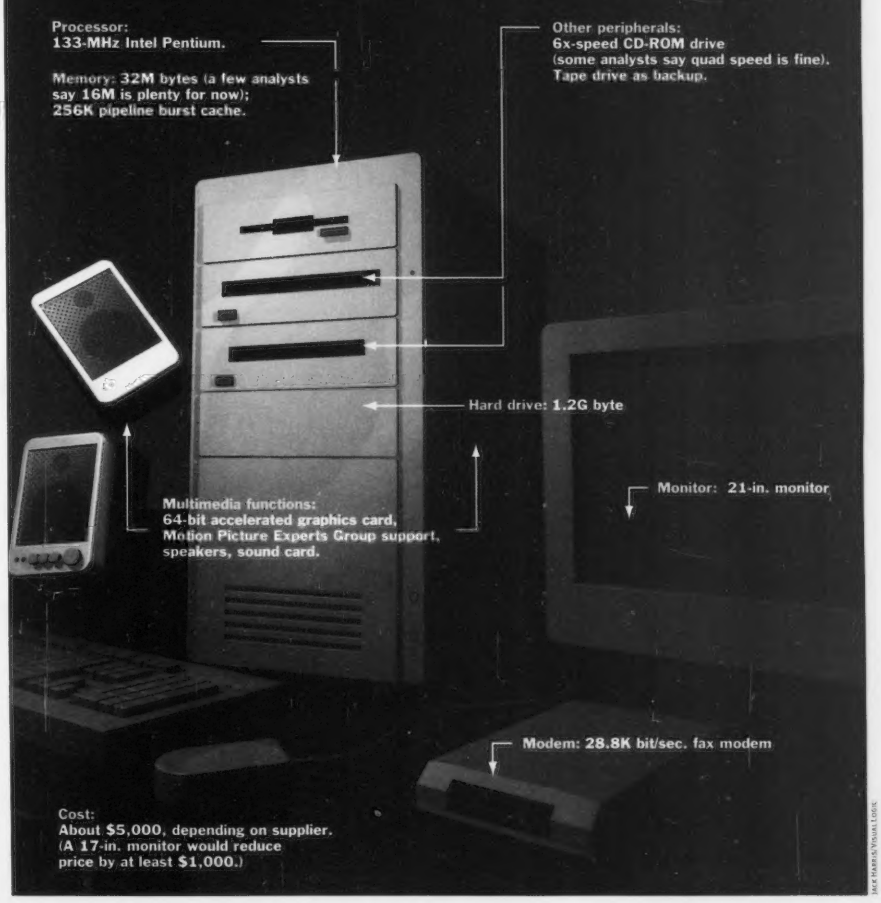
Wood acknowledges that United Grain's approach is a bit unusual, but he says it was an obvious outgrowth of an existing IS strategy. United Grain operates 235 grain elevators throughout Canada and has systems installed at most sites. Because many of its grain elevators are in remote locations, United Grain was paying a premium for service from various vendors. In the late 1980s, the company decided to halt its service contracts and handle all support internally.

This in-house support group is made up of engineers who know not only how to support systems, but also know how to build them.

"We came to the conclusion that we could do a passable job and do it cost-effectively," Wood says. "And we've never looked back." — *Rosemary Cafasso*

High(-end) Hopes

Following are what industry analysts identify as ideal features for a state-of-the-art PC running demanding applications, such as big spreadsheets and database searches and high-end graphics work. This dream machine is assembled to handle multimedia applications, although items such as a CD-ROM drive should also be considered for general business purposes.



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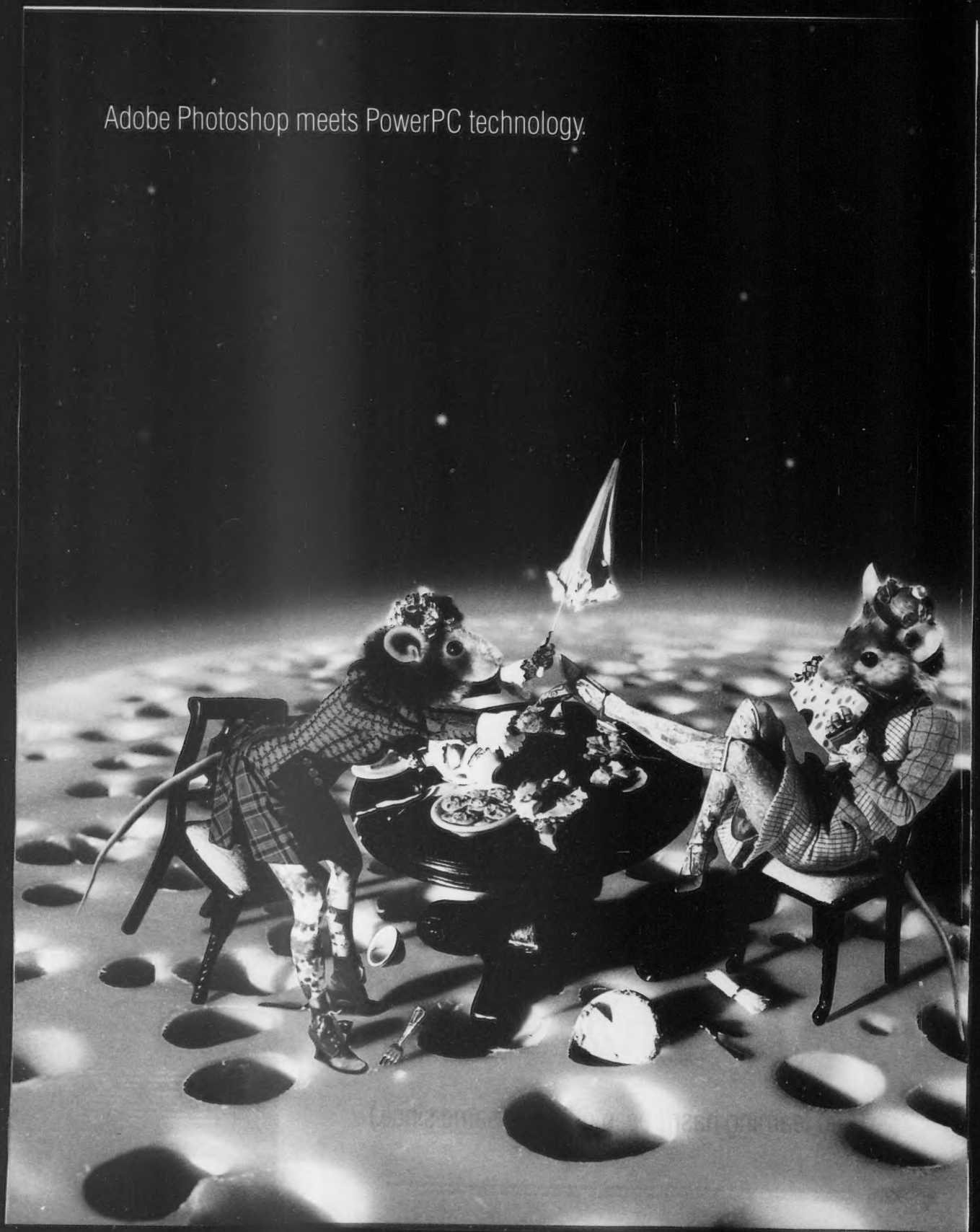
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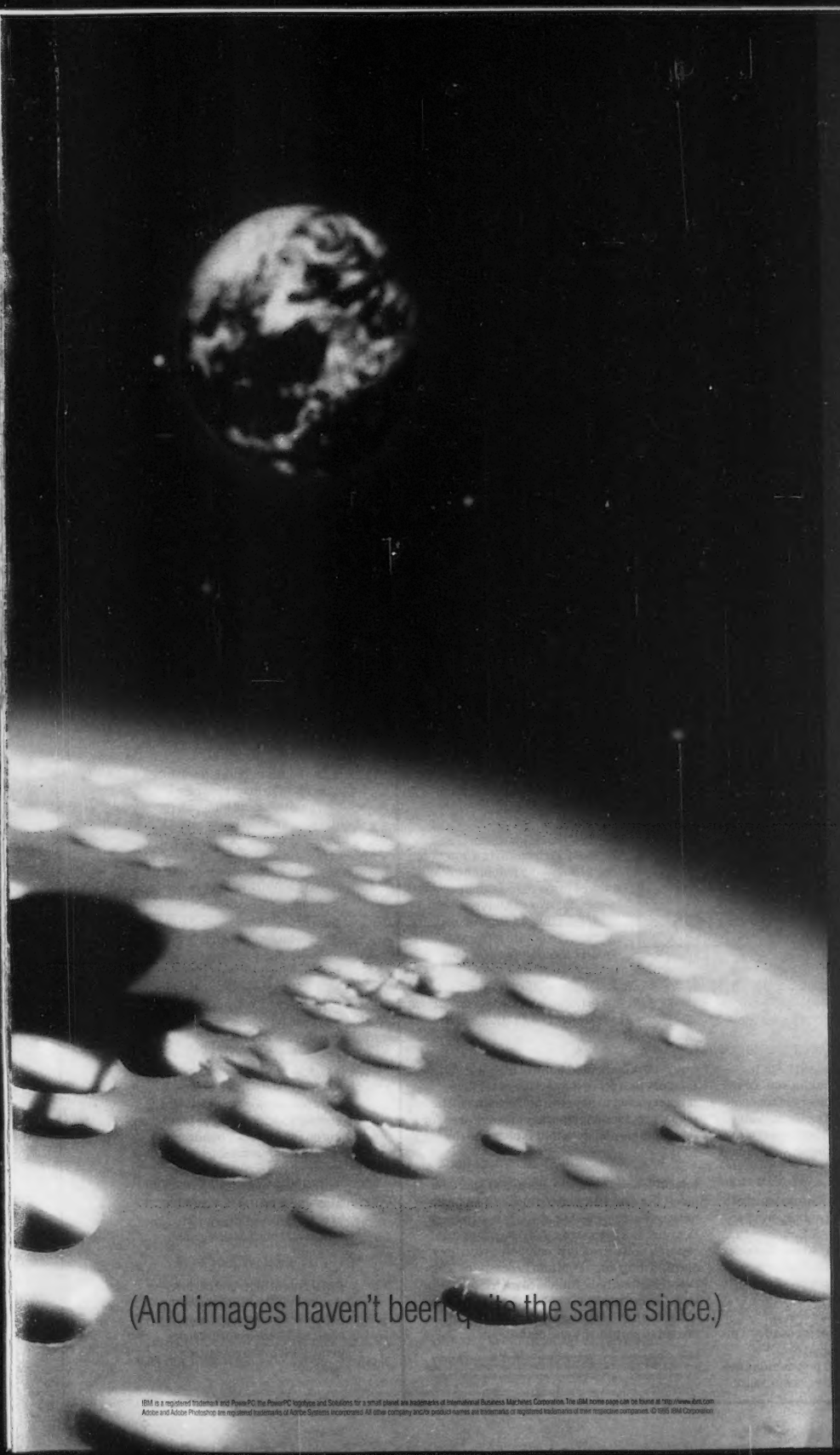

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PC Buyers' Advisory

Waiting for your chip to come in

New-generation processors

Here's a look at the new generation of processors, which offer speeds from 133 MHz (Intel's P6 – now called Pentium Pro) to 300 MHz (Digital's Alpha 2116). All processors listed sport a 64-bit RISC architecture, with the exception of Intel's Pentium Pro, which offers a 32-bit CISC architecture.

PROCESSOR	PowerPC 620	PA8000	Mips R10000	UltraSPARC	Alpha 21164	Pentium Pro
Vendors	IBM, Motorola, Apple	Hewlett-Packard	Mips Technologies	Sun Microsystems	Digital	Intel
Initial clock rate	150 MHz	190 MHz	200 MHz	166 MHz	300 MHz	133 MHz
On-chip cache	64K bytes	None	64K bytes	32K bytes	112K bytes	Level 2: 256K bytes
Maximum secondary cache	128M bytes	2M bytes	16M bytes	4M bytes	64M bytes	None
SPECfp92 vendor estimates	300 (@133 MHz)	550	600	305	500	NA
Availability	Q1 1996	Year's end or Q1 1996	Year's end or Q1 1996	Year's end or Q1 1996	April 1996	Year's end or Q1 1996

Source: Datapro Information Services Group, Delran, N.J.

Here are some terms and facts of interest in the high-end PC market

EXTRAS

Pentium — In the fall of 1992, Intel adopted the name Pentium for its 80586 chip, its successor to the 80486. It formally introduced the Pentium in April 1993. The chip is capable of 112 MIPS and is 80% faster than the fastest 80486. It contains more than 3 million transistors and is said to be a superscalar chip, meaning it can execute two instructions at a time.

Pentium Pro — Code-named P6, Intel's next-generation processor is expected to have a clock speed of 133 MHz. Systems are being announced now for volume delivery early next year.

PowerPC — A goal of the joint IBM/Apple Computer, Inc. alliance to make a superpowerful PC that runs virtually every PC operating system, including MS-DOS, Unix, Windows, OS/2 and Macintosh. The PowerPC also will run under a new operating system called "Power Open."

Megahertz, or MHz — This is the measure of a chip's clock speed. To help put things in perspective, 1 MHz equals 1 MIPS. Consider that as vendors start to deliver systems that offer speeds of 200 MHz (PowerPC). Digital is slated next year to deliver a chip with speeds reaching 300 MHz.

MIPS, or million instructions per second — This is the execution speed of a computer. For example, 0.5 MIPS is 500,000 instructions per second. High-speed PCs and workstations perform at 100 MIPS and higher. MIPS measures raw CPU performance but not overall system performance.

MIPS/MHz relationship — You can derive MIPS from MHz if you know how many machine cycles it takes to execute an instruction in the CPU. For example, a 486 processor takes 1.9 cycles on average. To obtain MIPS on a 50-MHz 486, divide 50 by 1.9, yielding 26 MIPS.

We've come a long way since IBM introduced its 8088 PC in 1981. The 8088 processor has a clock speed of 4.77 MHz at 0.33 MIPS and 8 MHz at 0.75 MIPS.

Cache — A dedicated bank of high-speed memory or a reserved section of regular memory used to improve performance. The cache provides a temporary storage area for instructions and data that is closer to the CPU.

Intel CPU competitors — Advanced Micro Devices, Inc. is scheduled to release a K5 product early next year that plugs in to existing Pentium motherboards. AMD merger target NexGen Software Corp. competes with low-end and midrange Pentium processors. The PowerPC family continues to gain momentum. Cyrix Corp. has two Pentium-class solutions, the 5x86 and the M1 processor, which are set to ship by the end of the year.

Sources: Definitions drawn from *Newton's Telecom Dictionary* by Harry Newton, 1995; *Electronic Computer Glossary* by Alan Freeman, The Computer Language Co., 1995; *Computers, a visual encyclopedia* by Alpha Books, 1994.

SNEAK PEEK

Things to come in the next year

Here are a few predictions on what to expect in the high-end PC market, according to Joe Ferlazzo, a senior analyst at WorkGroup Technologies:

- Desktop PCs now considered at the high end will be at the low end next year and will have the same price range of $2,500 to $3,000.
- The Pentium Pro chip will further blur the lines between workstations and high-end desktop PCs as chips reach speeds of 200 MHz.
- Sun Microsystems, Inc. will have to watch its back. The SPECint ratings for the Pentium Pro will blow away the new Sun architecture. There's going to be some real sparring going on. The SPARC architecture will still have a good story because of its 10,000 applications, whereas Windows NT only has roughly 2,500.
- Windows NT will pick up volume in the corporate desktop area, so more independent software vendors will be jumping on the 32-bit NT bandwagon. This means machines powered by the Pentium Pro will become more accepted as high-end desktop PCs capable of high-end graphics, multimedia and multitasking applications.
- In terms of high-end PC integration, Intel will continue to push its native signal processing. There's more of a demand for it in the consumer market.

High-end desktop PCs, *page 122*

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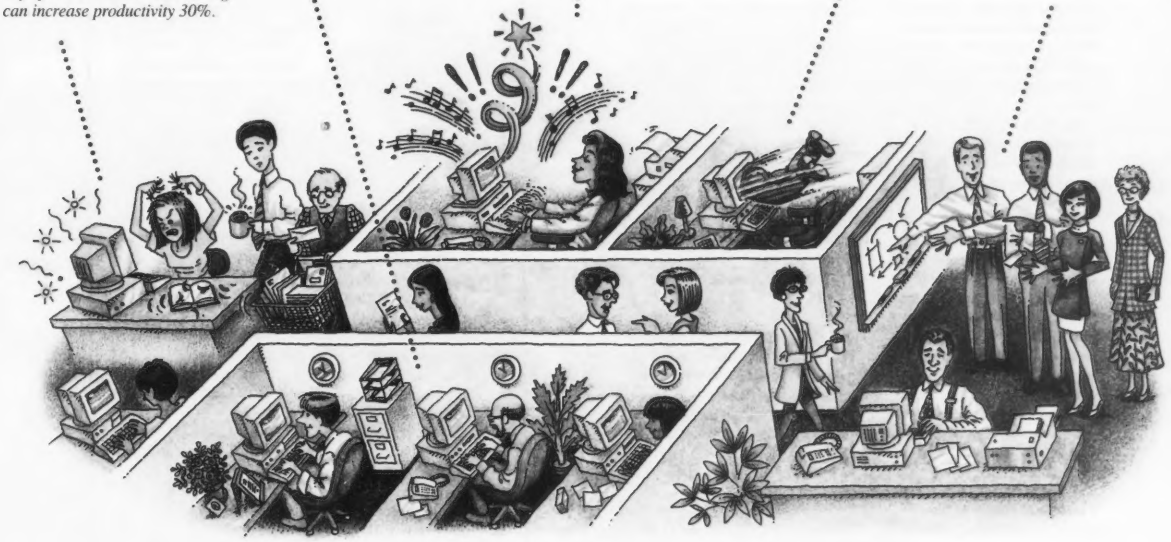

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PC Buyers' Advisory

Continued from page 120

A sampling of comments from technical reviews

• With the Power Macintosh 7500/100, Apple has created a computer with flexibility and power in an elegant, expandable design, all at a good price. Strong video, sound and networking capabilities make it an excellent machine for Internet browsing and publishing.
—*Macworld*, December 1995

• Here's what *Business Week*'s First Annual Guide to Desktops — which used National Software Testing Laboratories, a Division of McGraw-Hill, Inc. — had to say about some of their top picks.

On Dell's Dimension XPS P133C: "Dell provides strong documentation and preloads Microsoft Office, making it easy to launch Excel and Word."

On Compaq's Presario 9546: "Awesome sound and color-coordinated cables make setup simple."

On The Acer Group's Aspire 2125: "A stylish aerodynamic look, but a plastic wrist rest attached to keyboard was annoying."

On IBM's Aptiva: "A small footprint desktop unit with speakers that produce good sound."
— *Business Week*, Nov. 6, 1995

• In tests of machines from Hewlett-Packard, Digital, IBM and Micron Electronics, measurements of CPU, cache and memory operations showed the 150-MHz Pentium Pro running a 16-bit benchmark 1% to 6% more slowly than a 133-MHz Pentium. However, 32-bit tests of the same subsystems ran about 50% faster on the newer chip, compared with its predecessor.
— *PC Week*, Oct. 16, 1995

• A PC Week Labs test found Cyrix's new 100-MHz 6x86 performs better than the 133-MHz Pentium on 32-bit code and draws even with 16-bit code. And the 6x86 is offered at a lower price; at $450, the 6x86 chip will cost system manufacturers about $250 less than the 133-MHz Pentium, which is priced at $684 each in quantities of 1,000.
— *PC Week*, Oct. 9, 1995

• What separates the winners from the wanna-bes is how they harness raw horsepower into a well-engineered package. It was no surprise to see three of our four 133-MHz Pentium submissions — Gateway 2000's P5-133XL, Micron Electronics' P133 Millennia and Dell's Dimension XPS P133C — dominate the performance charts. We were surprised, however, at the relatively poor showing of the four computers we tested based on NexGen's 100-MHz NX586 chip. These systems lagged further behind both the 120- and 133-MHz Pentium offerings than expected in the Winstone 95 application benchmark.
— *PC Computing*, September 1995

• In benchmark testing, Digital's Celebris XL 5133 fared well against other 133-MHz Pentium systems also running Windows 95, matching the performance of Micron Electronics's P133 Millennia.
— *PC Week*, Aug. 21, 1995

• The four systems we review here — from AT&T, Dell, Gateway 2000 and Micron — are the first we've seen with the new 133-MHz Pentium CPU. Dell's Dimension XPS P133C is the hands-down performance leader of the group, and at $3,799, it's the least expensive. The Micron P133 Millennia is a half step behind the Dimension in overall performance and has a higher price tag. It offers a six-speed CD-ROM drive as standard equipment. Gateway 2000's P5-133XL includes the only multi-CD disk change. AT&T's Globalyst 730 provides the best telephony integration we've seen in a PC.
— *PC Magazine*, July 1995

Summaries of recent announcements in the industry

Several major hardware vendors unveiled systems based on the Pentium Pro chip, including **IBM**, **Hewlett-Packard**, **Dell**, **Unisys Corp.**, **Data General Corp.**, **AST Research, Inc.** and **NEC Technologies, Inc.** These announcements are expected to set the trend for a new class of relatively low-cost, standardized, single-processor and multiprocessor Pentium Pro-based products.

Advanced Micro Devices announced it will acquire rival **NexGen** in a move aimed at bolstering AMD's competitive position against **Intel**.

Three companies are expected to ship chips this month to challenge Intel's low-end Pentiums. **Cyrix** will boost the speed of its 5x86 processor from 100 MHz to 120 MHz; **Texas Instruments, Inc.** will bring out its first 486DX4 processor, which will run at 100 MHz; and **AMD** is expected to announce its 133-MHz AM5x86.

Intel said it is preparing to unveil 180- and 200-MHz Pentium Pros.

IBM announced its first 133-MHz Pentium desktop system. It will be priced at $2,700. Delivery date is slated for Nov. 14.

Intel plans to ease users into the world of 64-bit computing with a 32-bit version of its next-generation P7 microprocessor, according to sources at the recent Microprocessor Forum in San Jose, Calif. The 32-bit Intel chip will appear before the late-1997 debut of the full-fledged P7, which Intel is developing with HP.

IBM cut the prices of its entry-level 75-MHz Pentium systems from $1,695 to $1,366 and, according to published reports, is expected to cut prices on its 100-MHz Pentium-based IBM PC 300 models by as much as 20% to 25%.

IBM and **Motorola, Inc.** announced at the Microprocessor Forum plans for an update to their 604 microprocessor. The 604E is due in the first quarter of next year. Meanwhile, **NexGen** previewed its next-generation CPU, the NX686, which will be 1.3 to 2 times the speed of Intel's Pentium and Pentium Pro chips. The chip is expected to premiere at 180 MHz.

FYI

For more information about individual PC vendors, check the Internet. Most of these vendors have home pages (i.e., http://www.ibm.com) on the Internet. Also, most vendors are the subject of dedicated discussion groups on CompuServe, America Online and Internet newsgroups.

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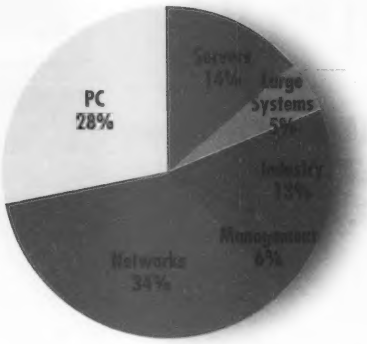
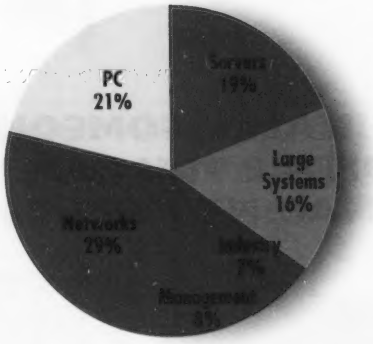


July 10, 1995
Editorial Profile



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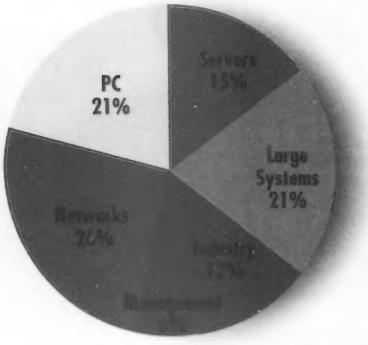
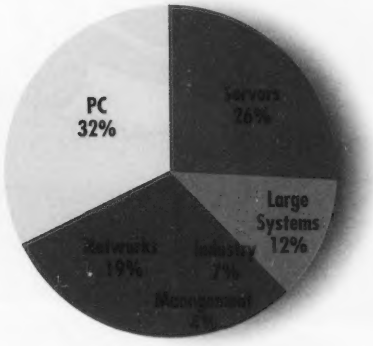


August 7, 1995
Editorial Profile



August 14, 1995
Editorial Profile

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The world of Information Systems doesn't stand still. And neither does *Computerworld*.

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One week, workstations take center stage. The next, PCs are in the spotlight. Later, networking is the focal point.

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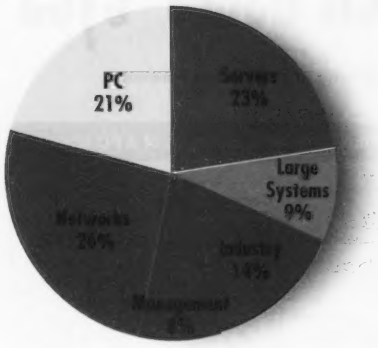

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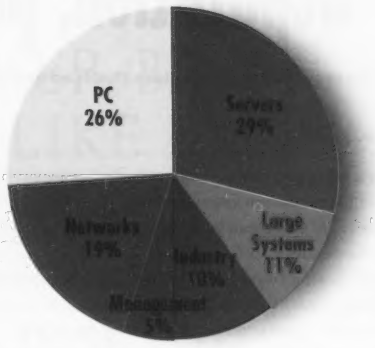

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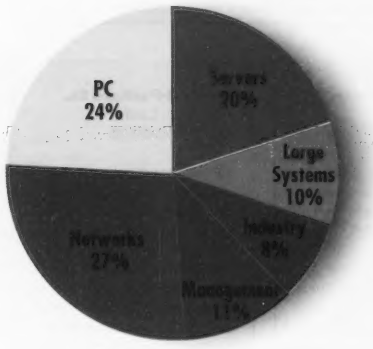

August 21, 1995
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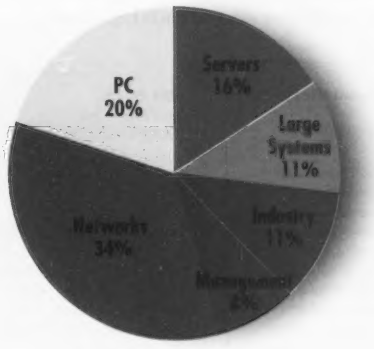

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The Newspaper of IS

COMPUTERWORLD BUYERS' SATISFACTION

Reputation, price catch users' eyes

The most important factors that lead users to a PC vendor have nothing to do with the hardware

BY KEVIN BURDEN

Choosing a PC vendor is not always a logical process for users. Vendors so often leapfrog one another for technology leadership that it can be a mind-boggling task to stay on top of all the changes.

So instead of boring you with all the technical tail-chasing details — which current users don't give a hoot about, according to our Buyers' Scorecard survey — we will focus instead on how nontechnical issues play a large role in the vendor selection process.

Computerworld hired First Market Research Corp. in Austin, Texas, to survey 50 users of each vendor's product. We asked what criteria were important in their decisions and then asked them to grade their satisfaction in key categories.

What is most important in your choice of a PC brand?

	Compaq	IBM	Dell	HP
Vendor's reputation for quality products	**52%**	33%	38%	**48%**
System price	28%	22%	**58%**	**48%**
Compatibility with systems software and major applications	28%	**35%**	32%	14%
Vendor's reputation for support	8%	24%	24%	26%
Compatibility with own applications	20%	18%	10%	12%

Percentage of users based on 50 users per vendor.
Multiple responses accepted; responses listed in order of importance to all users.

Compaq Computer Corp.
Houston
(800) 345-1518

Compaq had the most users citing reputation for quality as the best criterion in this market of look-alike, do-alike products. And judging by the firm's reliability rating, users are onto a good strategy.

Ninety percent of Compaq users surveyed gave favorable marks for system reliability. In fact, Compaq consistently scored well in 11 technology categories. The exceptions were in effective use of memory and effective use of cache.

When grading for support, users of all vendors were less than generous, but Compaq's users were downright stingy. Compaq lagged its competitors in quality and responsiveness of telephone support.

IBM PC Co.
San Jose, Calif.
(800) 426-7299

Compatibility was most prominent in the minds of IBM customers. Reputation ran a close second, although IBM had the fewest users saying reputation made a difference. IBM had the fewest users awarding "good" or "very good" grades in six of the 11 technology categories.

Compared with the competition, IBM's ratings appear subpar but are respectable on their own. IBM scored much lower than the other vendors in terms of "good" and "very good" ratings for reliability and value, but the remaining percentage scored them "average" rather than "poor."

IBM users gave the company the second-highest overall satisfaction rating.

Dell Computer Corp.
Austin, Texas
(800) 613-3355

Dangle attractive prices with substantial value, and watch users bite. That's what Dell does, and that's the No. 1 reason these users buy Dell. System price was 20% higher than the users' second critical decision factor, reputation.

Dell held its own in the 11 technology categories. It had the most users, 50%, willing to give "very good" scores for CPU speed; HP was second with 38%.

In the other categories, which included disk drives, overall hardware performance, effective use of memory and effective use of cache, Dell was most often a close third. But the high value made up for any shortcomings, according to users.

Hewlett-Packard Co.
Palo Alto, Calif.
(800) 752-0900

HP customers put equal importance on price and reputation. A sign that HP may be on the right track in those areas is that its users offered high satisfaction ratings for reliability and value.

HP's reliability was equaled only by Compaq, although HP had a slight edge because its 90% included more "very good" than just "good" ratings.

The same can be said for value: While the difference between HP's and Compaq's scores below are insignificant, HP's concentration of "very good" scores was higher.

HP also scored higher than the others for its willingness to negotiate hardware prices.

SCORECARD: Percentage of users giving grades of a "good" or "very good"

	Compaq Computer Corp.	IBM PC Co.	Dell Computer Corp.	Hewlett-Packard Co.
Reliability	90%	69%	82%	90%
Value	64%	47%	72%	66%
Support*	20%	32%	26%	26%
Supply availability	50%	33%	52%	44%
Overall satisfaction	70%	63%	58%	52%

*Average of seven separate support categories

SynOptics & Wellfleet

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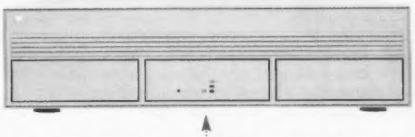

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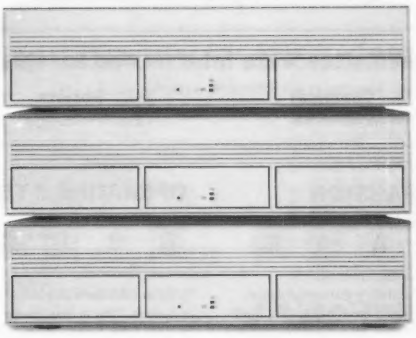

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New Power Macs score well but are hobbled by operating system

BY KEVIN BURDEN

The second generation of Apple Computer, Inc.'s Power Macintoshes improves on the first generation's speed and upgradability and incorporates Peripheral Component Interconnect (PCI) expansion slots, a faster emulator and enhanced system software. You get all this and more for about the same price as the first generation.

We interviewed four Power Macintosh users for this evaluation. Two use the low-end 7200, one uses the 8500, and the fourth uses high-end 9500s. None use the 7500, but two users said they had tested it.

What's best about these systems? All agreed it's the PowerPC 604 processor used in the higher-end systems. Some of the users blamed the 604 for compatibility problems with on-line services but said its performance more than overshadowed any minor problems.

In addition, the Macintoshes are still shackled by their operating system, according to one user. Because Apple's System 7.5.2 does not perform true multitasking, it isn't taking full advantage of the hardware, users complained.

And if you think availability is a problem, you're right. Depending on the model, expect to wait six to 12 weeks from the time of order until the system hits your desk.

Apple's Power Macintosh 8500: Users say its best feature is its PowerPC 604 processor

Users at these sites were interviewed for this evaluation:

- Education/University
- Chemical company
- Service company
- Manufacturing company

PERFORMANCE

A A A A

Each evaluator gave performance the highest grade without hesitation. This shouldn't be surprising because the 75- and 90-MHz CPU speeds in the low-end 7200 approach and exceed those of the 80-MHz 8100, the original high-end Power Mac machine.

Speeds across the line range from 75 MHz in the lower-end 601 processor used in the 7200 and 7500 to 132 MHz for the 604 processor in the top-end 9500.

Cache slots are standard to these systems; the cards to fill them are optional. But to the users interviewed, cache is anything but optional. They say they would definitely have given lower grades if their systems were running without cache.

Emulation mode is also much improved. "It's noticeably faster than how it ran on the [Power Mac] 8100," says David Young, vice president at Moody's Investors Service in New York. "You can now run Windows for Workgroups for getting E-mail or running a scheduler." Emulating Windows 95 is still not practical, according to Young. "We've done it, but it takes at least five minutes for the beast to boot up."

EXPANSION

A A A B

Expandability garnered much praise and few complaints. Each Power Mac offers plenty of expansion room; the high-end systems offer more room and options than the low-end machines. But what they all have in common are PCI slots that let them use a wide range of high-performance expansion cards. Many companies have announced cards, but few are shipping them. Evaluators have found them hard to come by.

So while these users couldn't comment on PCI performance or compatibility, they did say PCI is one area where they will use caution. "PCI is a new technology for the Mac. We'll go slow, choosing the cards that prove their reliability first," the user at the manufacturing company says.

Processor upgrades are easy on the 7500, 8500 and 9500. Each model has its processor on a daughtercard that can be swapped out for faster 604 processors.

The 7200 does not have a CPU upgrade slot, making a motherboard swap the only way to improve speed. This made some evaluators say they will buy more expandable 7500s and 8500s in the future.

OPERATING SYSTEM

B B B C

System 7.5.2 took the brunt of the criticism. "We've had compatibility problems between the [operating system] and the 604 chip," Young says. "We can't get CompuServe to run on the 9500. It's not finding the memory, and [CompuServe] has no problem on Power Macs without the 604 processor."

Some earlier compatibility problems are on the mend, such as the one between Open Transport and Mac Point-to-Point Protocol or Serial Line Internet Protocol.

But while revisions to problematic modules cure particular ailments, individual fixes are causing a version control problem for users.

Phillip Russell at Purdue University says he has four editions of the 7.5.2 operating system. "It's a user support issue — one I'd rather not have to deal with."

VALUE

A A A A

"For about the same price I paid a year ago for an 8100, I paid for this 9500," Young says. "If Apple continues to deliver that kind of value, we'll stay Mac for a long time."

Apple knows a lot about adding value, according to Russell. "They've been keeping prices the same while coming out with better boxes every three to six months."

Apple is also adding value by helping users save on their energy bills. This generation is the first family of desktop Macintoshes with energy-saving sleep modes, similar to those found on notebook computers.

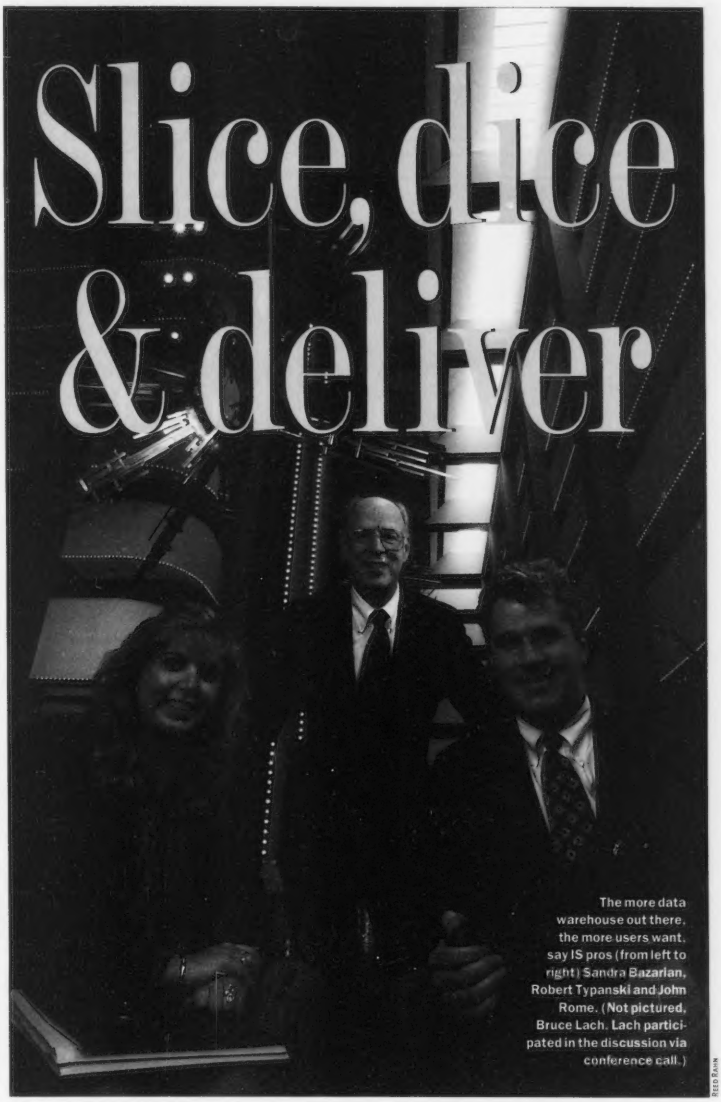
For some, it's great, but for others, it's only a nuisance. "If your machine goes to sleep while you're on the phone, it takes 10 to 15 seconds to come back up," the user at the chemical company says. That company disables the sleep mode.

Apple responds to supply problem

Our difficulty in meeting supply is caused by component shortages, forecasting miscalculations and manufacturing delays from our line running at 75%. To close the gap, we are targeting markets where demand time is critical like the education market in the fall, bringing on alternative sources for components and requiring that all manufacturing sites work 24 hours a day.

In Depth

Slice, dice & deliver



The more data warehouse out there, the more users want, say IS pros (from left to right) Sandra Bazarian, Robert Typanski and John Rome. (Not pictured, Bruce Lach. Lach participated in the discussion via conference call.)

REED RAHN

Roundtable participants

SANDRA BAZARIAN
Senior IS analyst
DowElanco
Indianapolis

Bazarian led the selection and implementation of access and reporting tools. She chose tools from Business Objects, Inc. Early last year, two data warehouses were operational, using Oracle Corp. database engines on an IBM 3090 host and a Sequent Computer Systems, Inc. multiprocessor server. The system serves 250 users.

BRUCE LACH
Director, information systems
Dairy Foods Division
Land O'Lakes, Inc.
Minneapolis

Lach implemented a data warehouse two years ago for less than $500,000 and reduced his staff.

He faced demands for better information from his marketing division and a sudden need for new reports for a reorganized sales force. He was unable to add staff to meet the mounting demands, so he built a client/server data warehouse based on Red Brick Systems, Inc.'s Warehouse and Microsoft Corp.'s Excel spreadsheet, Access database and Visual Basic programming language.

JOHN ROME
Assistant data administrator
Office of data administration
University of Arizona at Tempe

Rome offered access to student data established in a Sybase, Inc. warehouse by using a Sun Microsystems, Inc. dual-processor 630 server and access tools from Brio Technology, Inc. in Mountain View, Calif.

ROBERT TYPANSKI
Manager of data, methodologies and architectures
Bayer Corp.
Pittsburgh

Bayer created its first data warehouse in 1990 by moving data out of legacy IBM IMS and DB/DC systems into an Oracle data warehouse on an RS/6000 590 server. Typanski operates six warehouses for specific business units, and two more are being developed. Central IS confers with business units about their needs and explains the chargebacks for a warehouse.

An insatiable demand for decision support makes data warehouses a hot commodity. But watch out: Users can get very possessive of their data.

By Charles Babcock

Three years ago, key users at DowElanco went to the information systems department and complained that when they compared similar sales data from three legacy systems, it didn't match.

"They were very uncomfortable that they weren't getting an accurate picture of their sales numbers," says Sandra Bazarian, a senior IS analyst at the Indianapolis-based joint venture of The Dow Chemical Co. and Eli Lilly and Co. Agricultural chemical sales drive the young company.

Slice, dice & deliver, *page 130*

Slice, dice & deliver

CONTINUED FROM PAGE 129

Bazarian and other IS staff members weren't responsible for the systems that produced the discrepancies, but they knew they had to clean up after them.

Enter the data warehouse, a repository for data gathered for decision support and analysis. Bazarian was part of a team that by last March had established two data warehouses that use Oracle Corp. database engines on an IBM 3090 host and a Sequent Computer Systems, Inc. multiprocessor server.

Today, 250 end users access the data warehouses. Bazarian says the company expects to move from the mainframe to another Unix server late this year.

Bazarian and other IS professionals agree the demand for meaningful information threatens to overwhelm the ability of information technology staffs to satisfy it. But IS professionals who have tried it say a data warehousing strategy can meet many of those demands.

Computerworld last month asked four IS developers (see profiles, page 129) at Digital Consulting, Inc.'s Data Warehousing Conference in Phoenix to share their experiences developing data warehouses. Each project was driven by business needs that were unmet with existing operational database systems.

CW: What were the "gotchas" in building a data warehouse?

BRUCE LACH: The thing that surprised me most was how difficult it was for business users to verbalize what they really needed to know.

I also was surprised by just how poorly we'd managed data in the past, just how messy it is.... It was a surprise to everyone just how bad off we were.

SANDRA BAZARIAN: We had quite a few gotchas.... We didn't do enough upfront planning. We felt like we didn't spend enough time with customers on the requirements phase to understand what they needed. We spent a lot more time with them on the access tools — "Help us understand what you want in a tool" — but not enough on what kind of data needs to be in reports.

CW: What data do you put in the data warehouse?

BAZARIAN: Every transaction in any Dow Chemical company is captured in a global data warehouse. Every night, we extract our unique data for DowElanco. We capture every single DowElanco order, and we summarize that into a monthly view. We've tried to help customers narrow the focus of what they really, really need.

CW: Do you find that users want to get around those limits and ask for additional things?

BAZARIAN: Yes, quite often. We have a business owner [of the data] who has responsibility for approving requests. That has worked well for us. [He sometimes says], "No, this isn't needed for the whole organization. I'm not going to let you guys spend time and effort on that."

LACH: We have a fundamental belief that you don't have to fill the warehouse with all conceivable information. To me, that only leads to a warehouse with more nonanswers than answers.

CW: What IS skills does a data warehouse demand?

BAZARIAN: It was our first client/server implementation. We had to go out and learn about middleware and TCP/IP and all the things you have to do to connect the client to the server. It's a totally different world than the mainframe.

ROBERT TYPANSKI: At one time we had a skill, that of data administrator and data modeler. We used data administrators in the '70s when we developed legacy systems. But as projects got behind schedule, the data administration function was sacrificed to get the programs done. We're still running the company on those systems. They're well-designed.

That is a critical skill we have to bring back. The data administrator is the person who has the business skills to meet with the customer, identify business requirements and structure the data in a way in which we can directly generate the database designs.

CW: Who makes better use of the data warehouse, low-level end users or managers who make high-level decisions?

TYPANSKI: There are a lot of business analysts out there who work on behalf of managers. Those are the ones primarily who access the data warehouse. They have become more and more beneficial, and more productive, as a result of the data warehouse. Management doesn't necessarily access the data warehouse as much as you would think.

JOHN ROME: Our business analysts are getting numbers for the deans at the [University of Arizona].

TYPANSKI: We have developed a couple of executive information systems, but they aren't very heavily used.

CW: Management wants an executive information system, but executives aren't using it?

TYPANSKI: Yes. Once a business analyst has structured one of his repetitive queries properly, it's there to be run. It's almost as if a new staff function is coming up: The business analyst who [knows] about the data and is skilled in the tools is becoming a very valuable position. The data warehouse is making that a much more powerful position.

BAZARIAN: Our experience has been different. DowElanco has made a commitment that high-end and low-end users are going to learn how to use these computers that sit on their desks. One reason we use [tools from Business Objects, Inc. in Cupertino, Calif.] is because we feel that as long as users have some basic computer skills, they can go after the data. I've trained the chief executive officer of the company and vice presidents. Once they get the hang of how to build a query and a report, we haven't

Slice, dice, *page 132*

Data warehouse defined

A data warehouse is a repository of data summarized or aggregated in simplified form from operational systems. End-user-oriented data access and reporting tools let users get at the data for decision support.

A data warehouse is:

INFORMATIONAL, NOT OPERATIONAL	ANALYSIS- AND DECISION-SUPPORT-ORIENTED, NOT TRANSACTION-PROCESSING-ORIENTED	USUALLY CLIENT/SERVER, NOT LEGACY HOST-BASED

"I wish there was a tool out there that could go out and truly understand legacy data, capture the metadata from it."

JOHN ROME

"Possessiveness is common. People in sales and marketing don't feel that anybody needs to look at their data."

SANDRA BAZARIAN

"The business analyst who is knowledgeable about the data and skilled in the tools is becoming very valuable."

ROBERT TYPANSKI

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Slice, dice & deliver

CONTINUED FROM PAGE 130

needed to get it from somebody else.

ROME: We've had a hard time telling a dean that he was going to have to learn this tool.

CW: Do you find any possessiveness over the warehouse data?

TYPANSKI: Definitely. Getting the message out to share the data is a very difficult one. There is a tendency for people who have paid for data in a project to look at it as their own.

This tendency isn't so much from selfishness. Once people make the data available to everybody else in the company, [the data owners] get questions about it. This takes away from their jobs. Maybe they want to share, but the rewards aren't there. We're trying to find ways, when other people in the company access data put out [by individual business units], to give those units credits of some sort, [such as credits against future chargebacks from IS].

BAZARIAN: Possessiveness is common. People in sales and marketing don't feel that anybody needs to look at their data. We have them decide who will have access to it. And they are very restrictive about who can look at it.

ROME: We have high-level data trustees who decide whether to grant access. If you want financial data, you go to the comptroller. If you want student data, you go to the registrar. Having people look at my data in comparison to theirs is where we've had some people raise their eyebrows.

CW: What data transformation tools do you have? Are they homegrown or ones that you have purchased?

LACH: For now we've been using old Cobol extracts and [SAS Institute, Inc.] routines — a very pragmatic approach. We focus on value first. I think the technical aspect will catch up. I don't believe all the tools that I want exist anyway. I'm stretching these [homegrown] tools to the maximum. About the time we reach their limits, I expect there will be a lot of changes in the marketplace.

ROME: There should be a better way of taking mainframe data and somehow dumping it in the warehouse. We looked at a lot of the different transformation tools, and they're just too costly now or too difficult to use.

TYPANSKI: With a warehouse, you're trying to extract data from your operational environment. Ours was in an IMS hierarchical database. The [computer-aided software engineering] tool that we used was relational and addressed only relational. The access tools from Prism [Solutions, Inc. in Sunnyvale, Calif.] helped us a lot. We benchmarked that tool before we purchased it and found about a 200% savings in productivity as opposed to writing straight Cobol programs to do that job.

CW: What are you missing technically?

TYPANSKI: One area is the integration of a data warehouse directory with query tools.

Our major need is for a directory system that allows users to browse through a directory with friendly business descriptions of the data and then be able to launch a query directly. We have our own homegrown directory and [now use a Prism directory].

ROME: As a pipe dream, I wish there was a tool out there that could go out and truly understand legacy data, capture the metadata from it. There's a lot of tools that say that they do [but don't for our purposes].

BAZARIAN: I would like to get away from building summary tables, if that is possible.

CW: How do you cost-justify a data warehouse project?

TYPANSKI: Our data warehouse is cost-justified to the management of each business unit [by parties requesting the warehouse]. We feel that there must be some benefit because they keep coming back for more. We're providing a facility for them to get data sooner and make better decisions.

LACH: Anecdotally, we've had enough response from the business people that they make better and more timely decisions. Certainly, they have reduced their efforts to prepare customer reviews on the consumer products side, reductions from three to four days in the past to maybe half a day.

ROME: We've never had to cost-justify the warehouse. There was a university department that needed ethnicity data to apply for a $1 million grant.

The applicant went to central IS and was told it would take a couple weeks to get that data. We had her sit down at the desktop, point and click, and get the data. [The department was] later awarded $500,000 of that grant.

CW: Is confidence growing or declining in the warehouse approach?

LACH: I think there is extreme confidence. I just finished my annual budget for 1996, and the general managers of the consumer division and the food services division both indicated that whatever I had planned, I should double it. They're expanding their thinking on what they can do with this type of information.

TYPANSKI: There was an initial surge of activity, then it kind of leveled off, and now it's on a steady increase.

CW: Is anyone doing data mining — looking for hidden patterns in warehouse data?

TYPANSKI: We're going back into it. We tried it 10 years ago with neural networks. We found back then that we didn't have good data. Now we have high hopes for that technology. It's an opportunity to raise the level of intelligence of our systems from algorithmic to judgmental. [One way our neural network pattern searching might be used is] determining whether you should extend credit to an individual. A lot of activities in a data warehouse are judgmental, not algorithmic, and that's the forte of a neural network. We feel data mining is an area with high potential. ■

Babcock is technical editor at *Computerworld*.

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http://www.starnetinc.com/pwp/larryg/index.html
The Data Warehousing Information Center

http://www.aladdin.co.uk/mw_spectra/collectn/database.html
Reports and how-to papers for building a data warehouse from Spectrum Reports, a U.K.-based market research firm

CONFERENCES

DB/Expo: Data Warehousing & Parallel Computing Conference, Bruno Bienheim, Inc., Dec. 4-8. Javits Convention Center, New York, April 15-19, San Francisco, (800) 232-3976

Data Warehouse Technology Seminar with Ken Orr, Digital Consulting, Inc.
Jan. 23-25, Toronto, (508) 470-3880

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Computer Careers

VIRTUES and VICES of the virtual corporation

By Melanie Menagh

AS INFORMATION SYSTEMS DEPARTMENTS experiment with virtual organizations, they are finding that the benefits can be many and varied, but so can the pitfalls. Either way, many IS managers say adopting new, more flexible ways of working is imperative. And they are experimenting with various staffing options, including short-term contract employees, consultants and telecommuting.

Provident Mutual Life Insurance Co. in Newark, Del., for example, has consultants supplementing internal teams, employees working at home and a software company that is staffed only when there is work to be done.

But such arrangements require strategizing, such as considering IS staffing needs for the longer term — months, even years, out. And as with any radical shift, change can take getting used to.

BIG PAYOFF

One of the primary benefits of a virtual IS department is ease of staffing. Hiring consultants on a temporary basis opens up a huge wealth of expertise to corporations at the right price.

"I think that companies are interested in this because there's a real scarcity of truly top IS people," says Charles S. Feld, acting chief information officer at Burlington Northern Railroad Co. in Fort Worth, Texas, and a staff-job escapee turned consultant.

"Companies can get a seasoned professional at a reasonable price," says Tom Stevens, president of MIS Consulting Services, Inc. in Suwanee, Ga., who now works as a consultant after years of staff jobs. "They get the benefit of my 30 years of experience in many different businesses and technologies. They don't have to make a huge investment in training someone on a new system. I go in for three or six months, make my recommendations, and then I go away."

TAKING THE JOB HOME

Companies can reap huge benefits from giving employees control over their work at home, including the ability to work across time zones.

"My people really appreciate the flexibility."

— Bard White, Spalding Sports Worldwide

Bard White, CIO and worldwide director of MIS at Spalding Sports Worldwide in Chicopee, Mass., says telecommuting is a vital component of the company's international operations.

"I'm all set up to communicate from home," he says. "I get up at 4:30 in the morning, so sometimes I've been on the system even before they get to the office in England. They arrive and my E-mail is waiting for them. They can be up and running on a problem and have some answers for us by the time our working day starts in Massachusetts."

LEANER BUT MEANER

In addition to cost savings, "having the fewest IS staff possible enables you to get people more focused on what they're working on," says David Reingold, corporate vice president for strategic services and marketing at Computer Horizons Corp., a job placement company for professional service personnel in Mountain Lake, N.J.

This model of a minimal core staff with help brought in as needed is particularly appropriate for the constantly evolving needs of IS.

"You can change your team depending on the job at hand," Reingold says.

STAFF WITHOUT A FACE

The principles of a virtual corporation aren't without drawbacks and caveats. A revolving door of personnel can pose difficult dilemmas for IS.

"It puts a heavy onus on the IS manager," says Guy Edwards, vice president of IS at Provident Mutual Life. "You have to remember that Employee X is working a four-day week, Employee Y is working 9:00 to 3:00. The big problems arise in meeting business partner expectations. If they want to talk to someone on Friday, and that person works Monday through Thursday, you've got to be sure someone who can help the partner is available."

Also, "the IS manager needs to be sensitive to isolation," says Judy Rapp-Guadagnoli, president of Telework Training International in Denver. "You need to keep teleconference calls going among IS team members and also between the IS team and other departments. Otherwise, isolation will depress productivity."

A RISKY BUSINESS

A contingency plan must be in place at all times because if something goes awry that only a telecommuter can fix, it could prove disastrous.

"The IS manager needs to be aware of problems that require someone physically present to make a repair or a correction," says George Almon, director of marketing at Green Bar, Inc., an IS consultancy in Denver.

Security risks also increase with a workforce that is spread out. "As you physically extend the network, your ability to control things is more difficult," Almon says.

"It can be very tough. You have to prove yourself all over again."

— Charles S. Feld, Burlington Northern Railroad

FEARS AND FEUDS

Having staff employed at different times, in different places and for different terms can breed some ticklish intradepartmental dynamics. There can also be resentment toward telecommuters among on-site employees.

"It's a new business model, and it can be difficult for people to make that adjustment," Almon says. "Upper-level managers are already uncomfortable with technology. Now the CIO is asking them to buy computers for telecommuters — they can't even keep an eye on those employees to see what they are doing." ■

Menagh is a freelance writer in New York.

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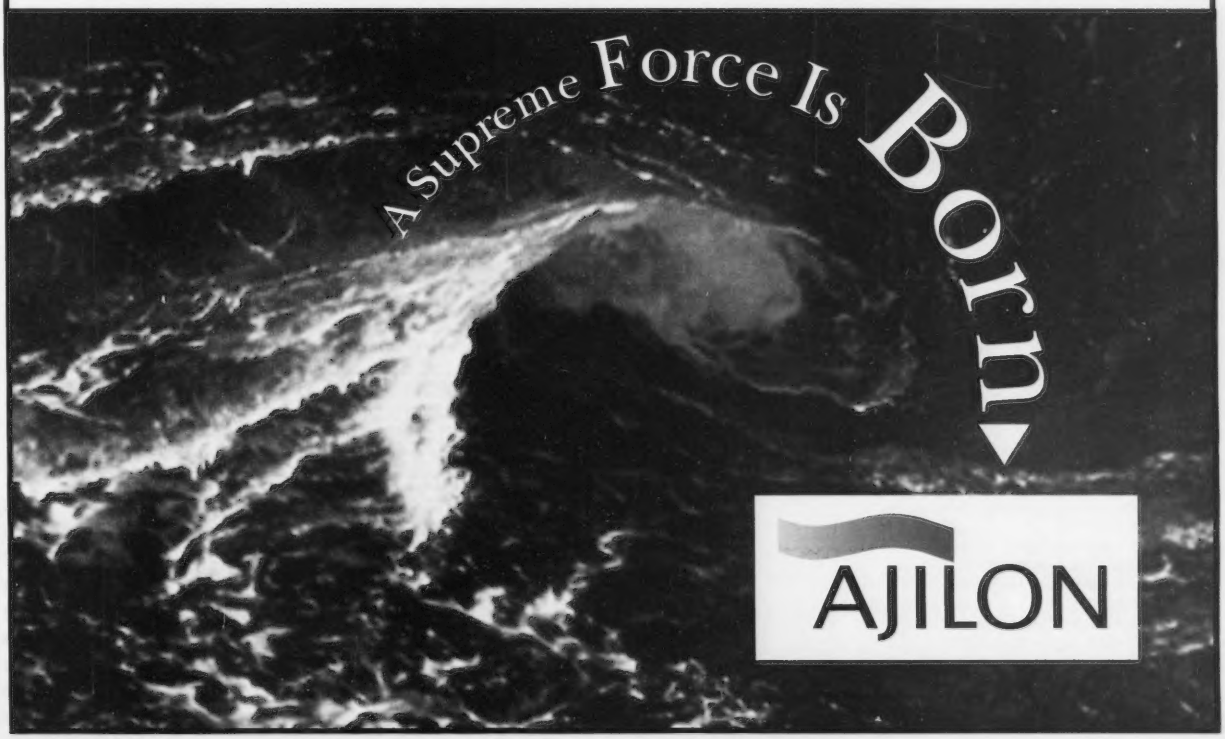

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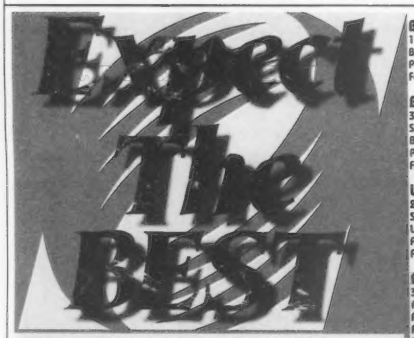

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ANALYST/PROGRAMMER (2 Positions Available) - Utilizing IBM compatible PC's, with SQL Server, NOVELL NETWARE & VISUAL BASIC, develop specifications and provide analysis, design, development, testing, documentation & implementation of software. Req 3 yrs exp in job or related EDP occupation. Exp must incl Multi-Layered Homogenous Network Architectures, Integration of Window NT Workstations & Advanced Server Configurations, Standardization & Configueration of Desktop Systems & Conversion of Legacy Applications, Client Server in Multivendor Environment. $40,000/yr. 40hrs/wk. 8:00am-5:00pm. Job Site: Charlotte, NC. Apply at nearest Job Service or send resume including SS# to Job Service, 500 W. Trade St., Charlotte, NC 28202. Job Order #NC2652590, DOT Code 030.162-014.

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ARCHITECTURE TEAM LEADER

We seek an accomplished team leader to coordinate support activities for the Application Programming Interfaces (APIs) and subsystems used by Systems Development. APIs include those to PowerBuilder, Tuxedo, Batch, and Interface architectures. Your duties will include supervising, training, mentoring, and supporting personnel; monitoring architecture enhancements and support requests; leading initiatives to evaluate and enhance programmer/analyst productivity; and working with the Group Leader to assign priorities, plan tasks, prepare budgets, and set objectives. We require a college degree (computer science preferred) or equivalent as well as working knowledge of client/server technology, messaging architectures, programming/testing tools, developer support considerations, and database products including DB2 and ORACLE. Experience in the evaluation and selection of development tools and middleware software products is preferred.

DEVELOPMENT SUPPORT TEAM LEADER

In this vital role, you'll coordinate support activities for tools used by Systems Development. In addition to the same duties as listed above, you'll be responsible for leading efforts to maintain and create standards and guidelines for tools usage; coordinating design and technical reviews for new development efforts; and leading ongoing efforts related to software site administration, software upgrade testing, upgrade rollout, and day-to-day usage support. This position requires a college degree (business or computer science preferred) or equivalent as well as familiarity with PC workstations, PowerBuilder, ABT, Method/1, programming/testing tools, and the Microsoft Office Suite. Experience hosting large educational sessions preferred.

INFRASTRUCTURE GROUP LEADER

This conscientious, self-directed professional will ensure that systems development support and internal project activities are accurately prioritized and aligned with company strategy and direction; that appropriate resources are allocated for projects; and that functions are coordinated within I/S to achieve project goals. This position directs leaders of technical areas including Database, Architecture, Development Support, and Desktop Tools Support. To qualify, you must have a bachelor's degree (computer science, MIS preferred) or 7 years systems experience in a tech environment plus 2 years as project leader. You must also have customer satisfaction and budget management skills; familiarity with current technical environment, client/server architecture, and systems development processes; and project methodology tools.

TECHNICAL SERVICES PROJECT LEADER

The Technical Services professional we seek will direct all functions relating to installing, maintaining, configuring, tuning and troubleshooting. Novell server hardware/software and PC workstations. Additional responsibilities include overseeing backup/recovery, storage administration, and security of Novell servers, developing/maintaining software distribution procedures to desktop PCs, setting clear objectives for project team personnel, providing staff training, recommending solutions for complex problems, initiating cost reduction efforts, and consistently meeting project deadlines. The candidate we select must be a results-focused team-builder with the leadership and planning abilities to insure the successful completion of projects and associated deliverables within budget parameters. We will also rely on you to work with the Group Leader to assign priorities, plan tasks, prepare budgets, and develop monthly project status reports for customers and management.

All four positions require strong oral/written communication and presentation skills; familiarity with facilitation, project estimating, and project management; the ability to prioritize multiple concurrent tasks; and superior team building skills.

SENIOR ARCHITECTURE ANALYST/POWERBUILDER

We will rely on you for developing and supporting PowerBuilder Execution and Development Architectures. Your development responsibilities will include architectural modeling, design, programming and testing. Your support activities include identifying enhancements to existing architecture components, answering questions on procedures and facilitation of workshops to train application staff. This position requires 3+ years of experience in programming in PowerBuilder and programming in a C or C++ environment. You will also need experience using a transaction manager such as Tuxedo and 3+ years of experience using an industry standard RDBMS. We prefer 5+ years of experience in applications development and experience with ORACLE.

SENIOR ARCHITECTURE ANALYST/TUXEDO

You will be responsible for developing and supporting Tuxedo Execution and Development Architectures. Your development responsibilities will include architectural modeling, design, programming and testing. Your support activities include identifying enhancements to existing architecture components, answering questions on procedures and facilitation of workshops to train application staff. This position requires 3+ years of experience in programming in a C or C++ environment, and configuration planning, tuning and programming experience in Tuxedo. Experience using an industry standard RDBMS is also necessary. We prefer 3+ years of experience in applications development and experience with ORACLE. We also prefer experience working in a production support or operations capacity, and experience working with UNIX application/shell script development.

SENIOR DATABASE ANALYST

The successful candidate will ensure the proper development and use of RDBMS software and the data resources under its control. The design and implementation of RDBMS databases and support of production RDBMS environments are additional functions. Skills in UNIX and ORACLE are desirable; C, data modeling, and DB2 abilities are preferred.

PERFORMANCE ANALYST

You will perform analysis and capacity planning for client/server and distributed applications; select tools and develop monitoring and measurement plans; and implement performance testing and performance management schemes. We will also rely on you to plan configurations capable of delivering acceptable performance to Application Systems. The qualified candidate will have a Bachelor's degree or equivalent work experience, strong knowledge of UNIX and client/server environments, and reasonably good mathematical and statistical skills.

UNIX SYSTEM ADMINISTRATORS

To qualify for this opportunity, you'll need 2 plus years of experience administering a Sun OS/Solaris network environment and advanced skills in managing a complex UNIX network (TCP/IP, NFS, DNS, NIS), coupled with the ability to install, configure, and maintain peripherals and operating systems. Knowledge of shell script programming, UNIX system security, remote system management, and performance analysis is essential. Excellent oral and written communication skills and ability to manage multiple priorities will be very important.

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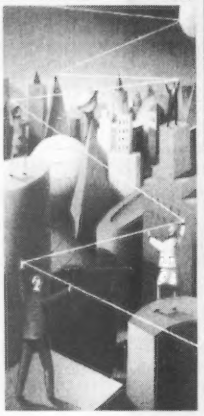

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PROGRAMMER ANALYST [2 openings] (Ref: 168795) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to clients' needs; maintain batch processes and online systems for the federal regulatory reporting systems for American Insurance Group. Development of systems to meet new regulatory requirements, and enhancement using MVS, ISPF, COBOL, VSAM, CICS, TSO, DB2, PASCAL, EXPEDITER, INTERTEST, JCL, UNISYS-CTOS & FINESSE. Reqs. Bach. in Comp. Sci., Computer Information Systems, Computer, Electrical or Electronic Engineering, Systems Analysis, Mathematics or its equiv. in ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Systems Programmer, Programmer/Analyst, Systems Analyst, Software Engineer, Assistant Manager (EDP) or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. exp. in job offered or related occup. in lieu of req'd ed. & exp. Must have some related exp. including using each of the following: UNISYS-CTOS, FINESSE, PASCAL and COBOL. $44,000/yr. 40 hrs/wk., 8:30a-5p. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref #. Employer Paid Ad.

SYSTEMS ENGINEER required. Design, analysis & programming of airline cargo systems using TPF Assembler & TPFDF Programming, real-time database design & expertise with airline CRS systems. Four years experience required in the job duties described above. Must have proof of legal authority to work in the US. Salary - $48,000/year for a 40 hour work week. Interested applicants apply at the Texas Employment Commission, Ft. Worth, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778-0001. J.O. Number TX7505210. Ad paid by an Equal Opportunity Employer.

Analyst/Programmer - Indianapolis, IN - Analyze, design and develop information systems on PC network/IBM mainframe in an IMS/TELON environment. Develop COBOL II and EASYTRIEVE programs using XPEDITER and FILEAID. Prepare program specifications and systems documentation. Enhance/debug & test existing systems and programs. Requires Bach Comp. Sci., Elect. Engr. or Math and 2yrs experience. M-F, 9AM-5PM, 40hrs/wk, $52,100/yr. Send resume with Social Security # to: Indiana Dept. of Workforce Development, 10 N. Senate Ave., Indianapolis, IN, 46204-2277, Attn: Gene R. Replogle ID# 3379582.

Programmer/Analyst (Engineering & Scientific Applications) (2 positions available), 40hrs/wk, 8-5, $40,000/yr. Use software engineering & conceptual/analytical tools to implement project plans including high level design & process specification. Programming & design of systems using C, 4GL, & Windows. C program development. Integrate C program interfaces. Develop & integrate GUIs & APIs in a Windows environment in desktop software solutions. Use scientific programming methodologies to create AI concept models for the assessment of diagnoses in a clinical environment for medical software project. Applications carried out in both UNIX & Windows environments. Min reqs: MS in Computer Science. 1 yr in carrying out those duties set forth in the job offered or 1 yr in C & 4GL programming under UNIX. Past design & implementation of a MS Windows application. Past design, development, & project management of a computer system through a complete life cycle. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. #TX7504171. Ad Paid by an Equal Opportunity Employer.

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Software Engineer to design & develop real-time embedded software for audio control systems; develop software in Assembly and C languages for multi-microcontroller system; design communication protocol & develop communication handler software for inter-processor communications using MS Windows environment on IBM PC compatible computers; influence microcomputer based hardware design; Reqs. Master's in Comp. Sci. &/or Engg., 1 yr exp in job offered or 1 yr related exp such as Research Assistant, Programmer Analyst or Systems Analyst. Related exp must include designing & developing communication protocols between multiple devices & controllers & development of embedded real-time software in Assembly language & C++. Must have used the following debugging tools: Emulators, Oscilloscopes & logic analyzers; $45,000/yr, 40 hrs/wk 8a-5p. Send resume with Soc. Sec. No. to Indiana Dept. Of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277, Attn: Gene Replogle. Include I.D. #3379584

SOFTWARE ENGINEER required. Software/systems development on real-time UNIX/C platforms running ORACLE RDBMS using object oriented analysis & design techniques, C/C++, CASE tools, UNIX System calls & socket programming. Also use TCP/IP networking protocol & develop GUI's in X/Motif. Masters degree or its Equivalent required in Math, Computers or Engineering, plus 1 year experience in the job duties described above. University level project work may be used to satisfy the experience requirements. Must have proof of legal authority to work in the U.S. Salary - $39,000/year for a 40 hour work week. Interested applicants apply at the Texas Employment Commission, Ft. Worth, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778-0001. J.O. Number TX7505209. Ad paid by an Equal Opportunity Employer.

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Must have the following experience in a major corporation:
- 3-5 years hands-on AS/400 experience using application languages and database language/utilities to solve business needs
- 1-2 years as an application programmer

AS/400 COMMUNICATIONS HELP DESK SUPPORT

Must have knowledge of the following:
- Configuring various modems, controllers and multiplexors
- Various LAN-based operating systems
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Must have the following experience in a major corporation:
- 3-5 years hands-on AS/400 experience focusing on communications support
- 1-3 years working in VTAM environment
- 1-2 years network help desk

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Must have knowledge of the following:
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2 Openings

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Mainframe Applications Development

Minimum of 2 years experience in one or more of the following: COBOL, MVS, EDI, CICS, Relational Database.

Client Server Applications Development

Minimum of 2 years with experience in one or more of the following: Visual Basic, C, C++, Uniface, PowerBuilder, Windows, UNIX, EDI, Relational Database (Sybase, ORACLE).

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Must have a minimum of 2 years experience of the following: Testing and deploying client/server applications on a HPlux operating system environment, relational database (Sybase/ORACLE), 24 hours support in a mission critical real-time environment, leadership skills.

Software Communication Analyst

Must have a minimum of 2 years experience of the following: FTP, TCP/IP, LAN, WAN, UNIX and Network Management, GUI development.

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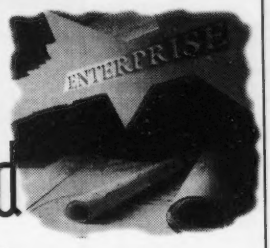

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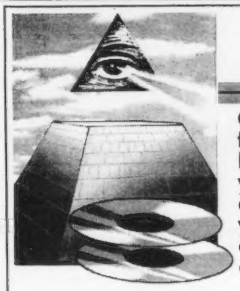

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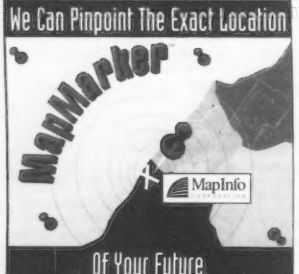

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PROGRAMMER ANALYST with experience in VAX/VMS, Sun OS (UNIX), IBM MVS, and Windows to provide professional/technical services to employer's area clients. Experience in maintenance & full life cycle software development including user interviews, analysis, design, programming, testing, user training & support. Application experience in such areas as inventory control, accounting, health care & imaging. Depending on clients' needs, Programmer Analyst will use the following: Motif, SQL, ACMS, DECFORMS, CMS, SCCS, CICS, X-Windows, SDK and GUI. Languages used: C++, C, COBOL, FORTRAN & LISP. Database experience must include: RDB, DBASE/CLIPPER, ODBC and INFORMIX. Position requires Bachelor's Degree in Computer Science or MIS or equivalent foreign degree and two years direct experience. Applicant may have gained experience in the job duties/skills listed above any time while working as a Programmer Analyst. If applicant does not have two years direct experience with one employer, willing to accept applicant with two years cumulative direct experience from different employers, provided experience included performing each of above-listed job duties at some point during two years cumulative employment. Salary $42,000/yr., 40 hrs/wk, 9am-5pm, ot/na, M-F. Must have proof of legal authority to work permanently in the U.S. Send 2 copies of resume to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 3 South, Chicago, Illinois 60605. ATTN: JANET ASCHENBRENNER. Ref. #V-IL 13817-A. NO CALLS. AN EMPLOYER PAID AD.

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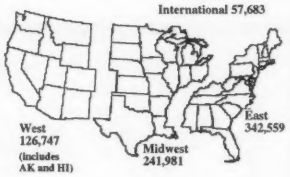

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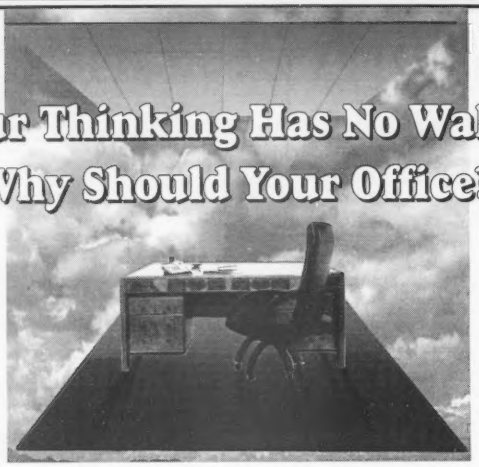

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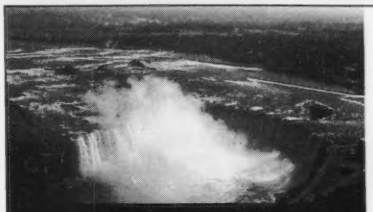

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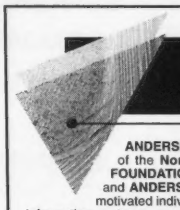

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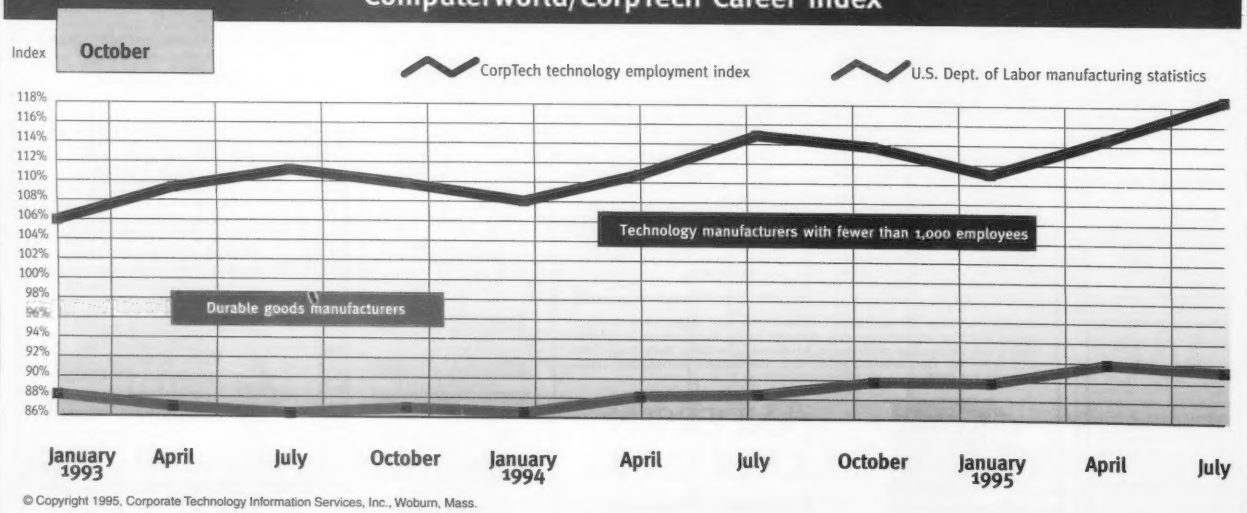

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Marketplace

Desktop PC prices dive

Pentium-based machines best PowerPC, Power Macintosh for low prices

By Lynn Haber

INTEL CORP. isn't the only game in town when it comes to competing on the desktop, but it sure looks that way. Having rolled out more than a half-dozen Pentium-class processors, Intel is keeping vendors hopping and buyers happy. Increasingly powerful processors continue to give users more bang for their buck.

That isn't so when it comes to PowerPC or Macintosh products. The PowerPC continues to be a product in search of a market, with no market incentive to drive prices down, according to analysts. Meanwhile, Apple Computer, Inc. struggles to keep up with Power Macintosh back orders and keep pricing on par with rival Intel-based products.

When it comes to desktop PC pricing, Pentium-based products set the pace for the industry. Today, 75-MHz Pentium machines are considered the best buy for average corporate buyers, analysts say. "Given the profile of most users looking for a personal productivity machine, P75s are fast and can be purchased for well under $2,000," says John Oltsik, an analyst at Forrester Research, Inc. in Cambridge, Mass. In the corporate environment, 75-MHz machines make sense, especially if you are on a LAN and storing files on a file server, he adds.

The base configuration for a low-end Pentium is 8M bytes of memory and a 340M- to 410M-byte hard drive.

Contrast 75-MHz devices with their high-end brethren, which boast 120- or 133-MHz processors. Typically configured with 16M bytes or 32M bytes of RAM and a 1G-byte or larger hard drive, these powerhouses cost more than $2,500. "The 133-MHz, in particular, is viewed today as a workstation alternative typically running [Microsoft Corp.'s] Windows NT vs. Win 95," Oltsik says.

Middle-of-the-road Pentium desktops are 90- and 100-MHz products. These products are more powerful than 75-MHz machines and still hit the sweet spot in the pocketbook, says Jennifer Munson, project manager at Workgroup Strategic Services, Inc. in Portsmouth, N.H. A typical product configuration includes 16M bytes of RAM and an 850M-byte or 1G-byte hard drive.

As Intel releases more powerful chips, which it did earlier this month with the Pentium Pro — previously known as the P6 — vendors are introducing fatter systems with more memory and bigger hard drives, Oltsik says. The price point stays the same and drives older processor models to the bargain basement. For example, beefy 486-based machines can be bought for as little as $1,200.

By the time Pentium Pro-based and 150-MHz products hit the streets at the end of the year, prices will decline. "By Q1 1996, the 75-MHz [Pentium] will follow the path of the 60-MHz and 66-MHz products," Munson says.

In the PowerPC camp, only the Power Macintosh has gained any stature as a mainstream desktop product.

But since introducing the Power Macintosh last summer, Apple hasn't been able to keep up with demand. "The company grossly underestimated its forecasted shipments," says Ryan Clark, an analyst at International Data Corp. in Framingham, Mass. As of the last quarter, Apple lost market share because it had a $1 million backlog for Power Macintoshes, Oltsik says.

Aware of the Pentium rivalry, Apple early on vowed to be price-competitive, and it even undercut some Intel-based products. But the company hasn't lived up to its promise, Clark says. The bottom line is that Apple can't keep up with the price cuts in the Pentium marketplace.

PC pricing sampler

System	Hard drive	RAM	Price
75-MHz Pentium			
Compaq	540M bytes	8M bytes	$1,931
Digital	540M bytes	8M bytes	$1,787
Hewlett-Packard	540M bytes	8M bytes	$1,792
IBM	540M bytes	8M bytes	$1,735
NEC	540M bytes	8M bytes	$1,725
90-MHz Pentium			
Compaq	720M bytes	16M bytes	$2,757
Digital	540M bytes	16M bytes	$2,747
Hewlett-Packard	1G byte	16M bytes	$2,717
IBM	850M bytes	16M bytes	$2,517
NEC	1G byte	16M bytes	$2,208
120-MHz Pentium			
Compaq	1G byte	16M bytes	$3,194
Digital	1.2G bytes	16M bytes	$3,074
Hewlett-Packard	840M bytes	16M bytes	$3,059
IBM	1G byte	16M bytes	$3,956

Source: Workgroup Strategic Services, Inc., Portsmouth, N.H.

The Apple premium

Clark says Power Macintosh products typically have been priced 25% to 30% higher than comparable Pentium machines. A recent price cut by Apple closed the gap, but further cuts by Pentium-based desktop vendors have again put a wedge between the product lines.

That means that, on average, a Power Macintosh costs $300 more than a comparable Pentium product. "Pentium-based PCs are a better buy," Munson says. This is particularly so in the corporate marketplace, where organizations are pressured to reduce help desk costs by limiting the number of diverse operating systems supported, she says.

Analysts agree that the PowerPC desktop market, outside of the Power Macintosh, must evolve. "The PowerPC has been slow to catch on," says Andrew Feit, director of the advanced desktop program at Dataquest, Inc. in San Jose, Calif.

Pricing for the PowerPC is comparable to that of high-end Pentium machines. "The promise of the PowerPC was that it would be priced competitively with Intel-based machines but run faster. To date, vendors' products haven't stayed significantly faster than high-end Pentium desktops," Feit says.

Oltsik says PowerPC products need a vendor to propel them into the marketplace. "The PowerPC needs a Compaq or a Dell to get it launched into the public's eye," he says. ■

Haber is a freelance writer in Norwell, Mass.

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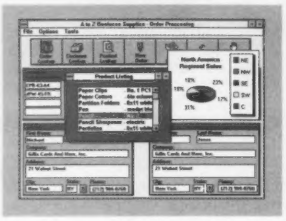

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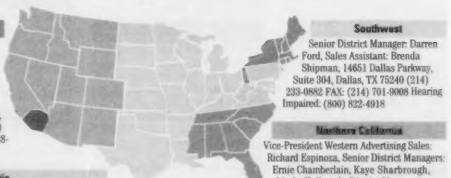

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Percent

Borland Int'l Inc.	35.6
Iomega Corp.	32.1
Quarterdeck Corp.(H)	27.0
Meridian Data Inc.(H)	26.6
Encore Computer Corp.	23.3
Net Worth Inc.(H)	23.0
Newbridge Networks Corp.	22.5
Comshare Inc.(H)	22.4

Dollar

Stratacom Inc.(H)	13.00
Picturetel Corp.(H)	9.00
FORE Systems Inc.(H)	8.75
Netscape Comm. Corp.(H)	8.00
Iomega Corp.	7.88
Net Worth Inc.(H)	7.75
McAfee Associates(H)	7.63
Quarterdeck Corp.(H)	7.25

Losers

Percent

Cirrus Logic	-26.2
Harris Computer Systems Corp.	-24.5
Radius Inc.(L)	-21.4
Intelligent Info. Systems	-19.0
4th Dimension	-18.6
Anacomp Inc.(L)	-16.7
QMS Inc.(L)	-15.6
Symantec Corp.	-15.0

Dollar

Cirrus Logic	-10.63
Progress Software Corp.	-5.50
Symantec Corp.	-4.00
Micron Technology	-3.88
Intel Corp.	-3.69
Harris Computer Systems Corp.	-3.25
ITT Corp.	-3.13
Boole & Babbage(H)	-3.00

Industry Watch

Wild ride on Wall Street

Up was down and down was up last week, as the usually hardy chip sector took a beating, Microsoft got downgraded and Apple Computer, Inc. (AAPL) shares, which recently took a pounding, actually rose on takeover rumors.

Several brokerage houses downgraded the semiconductor sector, including Cirrus Logic, Inc. (CRUS). Cirrus kicked off the plunge for chip stocks early in the week by telling investors that a key customer had cut orders for graphics and audio semiconductor chips.

Meanwhile, a report by Erik Jansen, an analyst at Alex. Brown & Sons, Inc. in Baltimore, predicted strong earnings opportunities for chip makers, while record semiconductor bookings and billings were reported in October. This led some to say the semiconductor market tremors were caused purely by analysts' unfounded fears.

"The semiconductor industry has had a great run for the last four years," and analysts are now "trying to predict that the top to the market has passed," said Dan Niles, an analyst at Robertson Stephens Co. in San Francisco.

On the PC front, Apple shares received a much needed boost from rumors that Hewlett-Packard Co. (HWP) was considering purchasing the struggling Cupertino, Calif., company. Reports also surfaced regarding Oracle Corp.'s (ORCL) interest in licensing Apple's Newton operating system. —*Stewart Deck and Tim Ouellette*

What a difference a week makes

Wall Street was up and down with technology news last week

Apple

Buyout rumors

Price Nov. 3 = 36 3/8
Price Nov. 9 = 39 1/2

Hewlett-Packard

Purchasing Apple?

Price Nov. 3 = 93 7/8
Price Nov. 9 = 93 1/4

Microsoft

Downgraded by Goldman, Sachs

Price Nov. 3 = 99 3/8
Price Nov. 9 = 99

Arbor Software

IPO on Nov. 7

Opened Nov. 7 = 17
Price Nov. 9 = 37 3/4

Cirrus Logic

Announced a reduction in orders

Price Nov. 3 = 40 5/8
Price Nov. 9 = 30 1/8

Micron Technology

Affected by downgrade of semiconductor sector

Price Nov. 3 = 68 3/8
Price Nov. 9 = 65

Exch	52-Week Range			Nov 10 Wk Net 3 PM Close	Wk Net Change	Wk Pct Change
Communications and Network Services					**UP 5.10%**	
COMS	53.63	19.63	3 COM Corp.	51.13	0.19	0.4
AIT	55.00	38.50	AMERITECH Corp.	53.13	-0.50	-0.9
APTS	15.00	6.75	Apertus Tech.	11.38	0.50	4.6
T	66.38	47.25	AT&T	63.00	-0.50	-0.8
ASND	73.63	7.00	Ascend Communications	73.63	5.38	7.9
BNYN	19.75	6.00	Banyan Systems Inc.	8.81	1.31	17.5
BNET	74.88	24.25	Bay Networks Inc. (H)	73.63	4.25	6.1
BEL	65.63	48.38	Bell Atlantic Corp.	62.63	-1.00	-1.6
BLS	39.13	25.25	BellSouth Corp. (H)	38.25	-0.25	-0.6
BBN	39.38	12.63	Bolt, Beranek & Newman	39.13	5.50	16.4
BRKT	22.25	9.75	Brooktrout Technology	20.50	0.50	2.5
CS	87.75	37.38	Cabletron Systems (H)	86.13	1.63	1.9
CGRM	25.13	12.25	Centigram Communications	21.38	0.00	0.0
CSCO	88.19	29.63	Cisco Systems Inc. (H)	88.19	4.44	5.3
CLIX	11.38	6.13	Compression Labs Inc.	7.69	0.25	3.4
CMNT	12.75	4.75	Computer Network Tech.	6.69	-0.06	-0.9
XCOM	14.50	8.38	CrossCom	13.50	0.50	3.8
DASW	4.75	2.25	Data Switch Corp.	4.38	-0.06	-1.4
DIGI	64.00	26.88	DSC Communications	38.19	-1.06	-2.7
FORE	63.50	24.88	FORE Systems Inc. (H)	63.50	8.75	16.0
GDC	35.88	9.25	General Datacomm Inds.	16.75	1.50	9.8
GTE	42.13	30.00	GTE Corp.	40.50	-0.88	-2.1
ITT	128.50	77.00	ITT Corp.	121.25	-3.13	-2.5
MCIC	27.13	17.25	MCI Communications Corp.	25.63	-0.13	-0.5
MICM	15.50	5.50	MICOM Communications Corp.	9.00	0.38	4.3
MNPI	23.00	8.13	Microcom Inc.	23.00	1.63	7.6
NTRX	10.50	3.63	Netrix Corp.	5.13	0.88	20.6
NCDI	12.00	3.75	Network Computing Devices	10.00	1.00	11.1
NWK	42.00	19.25	Network Equipment Tech.	33.75	-1.38	-3.9
NETG	46.50	19.75	Network General	42.63	0.00	0.0
NWTH	41.88	7.25	Net Worth Inc. (H)	41.50	7.75	23.0
NN	43.38	25.00	Newbridge Networks Corp.	38.75	7.13	22.5
NT	41.00	31.25	Northern Telecom Ltd.	36.88	0.50	1.4
NOVL	23.25	13.75	Novell Inc.	17.50	1.13	6.9
NYN	49.25	35.88	Nynex Corp. (H)	48.38	-0.50	-1.0
OCTL	42.63	17.75	Octel Communications Corp.	31.13	-2.25	-6.7
ODSI	43.25	10.38	Optical Data Systems Inc.	32.00	2.00	6.7
PNRL	8.38	2.13	Penril Data Comm Networks	5.50	-0.50	-8.3
PCTL	78.50	19.00	Picturetel Corp. (H)	78.50	9.00	12.9
PTON	10.75	4.75	Proteon Inc.	8.50	1.50	21.4
RACO	7.88	3.00	Racotek Inc.	5.88	-0.13	-2.1
RETX	5.50	2.13	Retix	2.63	-0.25	-8.7
SFA	24.88	11.38	Scientific Atlanta Inc.	15.38	1.88	13.9
SBC	57.25	39.63	Southwestern Bell Corp. (H)	54.75	-1.50	-2.7
FON	38.75	25.88	Sprint Corp.	37.75	-0.75	-1.9
SMSC	31.63	12.50	Standard Microsystems Corp.	22.50	3.00	15.4
STRM	80.50	25.25	Stratacom Inc. (H)	80.50	13.00	19.3
TBIT	8.13	2.38	Telebit Corp.	3.75	0.63	20.0
USRX	106.13	16.75	US Robotics (H)	104.38	4.25	4.2
USW	48.38	28.38	US West Inc. (H)	29.25	-0.25	-0.8
XIRC	21.00	8.88	Xircom	9.69	0.19	2.0
XLGX	78.00	15.13	Xylogics Inc. (H)	76.75	4.75	6.6
PCs and Workstations					**OFF 0.01%**	
AALR	9.63	3.63	Advanced Logic Research	7.69	-0.94	-10.9
AAPL	50.13	33.63	Apple Computer Inc.	40.00	3.63	10.0
ASTA	19.13	7.50	AST Research Inc.	9.50	-0.38	-3.8
CPQ	56.75	31.13	Compaq Computer Corp.	54.63	-0.38	-0.7
DELL	49.38	18.38	Dell Computer Corp. (H)	45.25	-2.25	-4.7
GATE	37.50	16.00	Gateway 2000 Inc. (H)	35.38	-1.81	-4.9
HWP	96.63	46.00	Hewlett Packard Co.	94.63	0.75	0.8
MUEI	29.88	5.13	Micron International Inc.	21.00	-0.38	-1.8
SGI	45.63	27.50	Silicon Graphics	37.25	2.63	7.6
SUNW	89.50	29.88	Sun Microsystems Inc. (H)	89.50	6.88	5.8
TAN	64.38	41.13	Tandy Corp.	46.00	1.13	2.5
Large Systems					**UP 2.52%**	
AMH	13.63	8.63	Amdahl Corp.	9.13	-0.19	-2.0
CNX	8.13	3.63	Convex Computer	4.50	0.00	0.0
CYR	29.25	14.63	Cray Research Inc.	23.00	1.25	5.7
DGN	14.13	6.25	Data General Corp. (H)	13.38	0.13	0.9
DEC	59.38	30.00	Digital Equipment Corp. (H)	59.38	2.63	4.6
ENCC	4.06	1.06	Encore Computer Corp.	2.31	0.44	23.3
NHWK	18.50	10.00	Harris Computer Systems Corp.	10.00	-3.25	-24.5
IBM	114.63	68.88	IBM	97.38	-2.88	-2.9
MDCD	12.50	3.00	Meridian Data Inc. (H)	12.50	2.63	26.6
NETF	8.88	4.25	NetFrame	5.56	-0.44	-7.3
SQNT	25.38	14.13	Sequent Computer Sys.	19.00	1.25	7.0
SEQS	10.00	3.13	Sequoia Systems Inc.	5.63	0.00	0.0
SRA	19.88	23.00	Stratus Computer Inc.	35.25	3.63	11.5
TDM	19.75	10.00	Tandem Computers Inc.	11.75	0.13	1.1
TRCD	7.13	3.38	TriCord Systems	3.56	0.06	1.8
UIS	13.63	5.50	Unisys Corp.	7.31	-0.38	-5.8
Software					**UP 3.94%**	
ADBE	68.94	27.25	Adobe Systems Inc.	68.94	7.19	11.6
AMSWA	8.75	2.50	American Software Inc. (H)	8.63	0.25	3.0
APLX	33.00	9.75	Applix Inc.	30.00	0.25	0.8
ACAD	53.00	31.25	Autodesk Inc.	38.13	3.88	11.3
BACH	7.88	2.00	Bachman Info. Systems	5.75	-0.13	-2.1
BGSS	40.50	22.00	BGS Systems Inc. (H)	40.50	2.25	5.9
BMCS	51.50	20.50	BMC Software Inc.	36.75	-0.25	-0.7
BOOL	38.50	22.50	Boole & Babbage (H)	35.00	-3.00	-7.9
BORL	17.63	6.00	Borland Int'l Inc.	17.63	4.63	35.6
BROC	10.50	5.75	Brock Control Systems Inc.	8.00	-0.13	-1.5
CESH	3.75	1.38	CE Software	2.00	0.31	18.5
CYE	23.75	10.50	Cheyenne Software Inc. (H)	23.00	1.25	5.7
COGNF	36.25	12.88	Cognos Inc.	33.00	0.00	0.0
CA	56.38	28.75	Computer Associates	55.13	0.25	0.5
CVN	14.38	3.00	Computervision Corp.	10.88	-0.75	-6.5
CPWR	43.00	17.50	Compuware Corp.	22.81	-0.94	-3.9
CSRE	35.50	10.75	Comshare Inc. (H)	35.50	6.50	22.4
COSFF	19.50	10.13	Corel Corp.	18.75	0.13	-0.7
DWTI	16.25	9.00	Dataware Technologies Inc.	12.19	1.31	12.1
FILE	51.00	23.00	Filenet Corp.	47.50	2.25	5.0
DDDDF	8.25	3.38	4th Dimension	4.38	-1.00	-18.6
FRAM	33.00	13.75	Frame Technology	28.13	0.00	0.0
FTPS	35.50	20.25	FTP Software Inc.	33.13	5.63	20.5
GSOF	26.00	8.75	Group I Software	13.50	2.25	20.0
GPTA	13.88	6.63	Gupta	7.88	0.50	6.8
HOGN	48.00	4.63	Hogan Systems Inc.	9.25	-0.38	-3.9
HYSW	56.75	31.25	Hyperion Software Corp.	49.38	-0.38	-0.8
IRIC	18.63	10.63	Information Resources (L)	10.81	-0.19	-1.7
IFMX	34.38	11.63	Informix Corp.	29.13	-0.50	-1.7
INGR	16.75	7.38	Intergraph Corp. (H)	16.75	1.63	10.7
LEAF	11.63	2.88	Interleaf Inc.	11.63	2.00	20.8
ISLI	26.25	12.63	Intersolv Inc.	16.38	-0.25	-1.5
INTU	89.25	29.63	Intuit Inc. (H)	83.75	4.50	5.7
LGNT	48.25	26.13	Legent Corp.	48.00	0.00	0.0
MGICF	11.50	3.63	Magic Software Enterprises	7.75	0.38	5.1
MANU	18.75	6.75	Manugistics Group Inc.	16.50	0.00	0.0
MAPS	40.00	18.75	MapInfo Corp.	20.00	-1.00	-4.8
MATH	7.38	2.00	MathSoft	5.63	0.25	4.7
MCAF	50.38	9.13	McAfee Associates (H)	50.38	7.63	17.8
MENT	22.88	12.13	Mentor Graphics	21.06	-0.56	-2.6
MIFGY	14.63	8.63	Micro Focus (L)	10.50	1.63	18.3
MGXI	13.88	5.13	Micrografx Inc.	12.75	1.38	12.1
MSFT	109.25	58.25	Microsoft Corp.	97.38	-2.00	-2.0
NETM	27.25	12.25	NetManage Inc.	23.50	2.50	11.9
NSCP	102.50	45.75	Netscape Comm. Corp. (H)	102.50	8.00	8.5
ORCL	47.50	24.75	Oracle Corp. (H)	47.50	1.38	3.0
PMTC	70.50	31.25	Parametric Technology (H)	69.50	0.50	0.7
PARQ	22.75	6.63	ParcPlace Systems Inc. (L)	7.25	-0.25	-3.3
PSFT	94.00	28.50	Peoplesoft	84.75	-0.50	-0.6
PTEC	14.38	6.13	Phoenix Technologies	11.38	-0.75	-6.2
PSQL	16.88	4.88	Platinum Software	6.38	-0.25	-3.8
PLAT	26.00	13.50	Platinum Technology	16.88	-1.13	-6.3
PRGS	70.50	29.75	Progress Software Corp.	57.50	-5.50	-8.7
QDEK	34.13	1.94	Quarterdeck Corp. (H)	34.13	7.25	27.0
RNBO	26.75	11.25	Rainbow Technologies Inc.	23.50	1.88	8.7
ROPS	10.13	2.00	Rasterops	7.44	0.00	0.0
ROSS	7.75	2.19	Ross Systems	3.00	0.00	0.0
SKEY	51.75	18.50	Softkey International Inc.	33.88	-0.75	-6.2
SPCO	6.00	2.88	Software Publishing Corp.	3.88	0.50	14.8
SOTA	12.50	6.25	State of the Art	10.38	-0.50	-4.6
SSW	49.88	29.63	Sterling Software Inc.	49.88	4.13	9.0
SDRC	21.13	4.63	Struct. Dynamics Research	20.13	0.44	2.2
SYBS	55.00	19.88	Sybase Inc.	37.75	-0.88	-2.3
SYMC	33.25	15.50	Symantec Corp.	22.75	-4.00	-15.0
SNPS	38.50	19.75	SynOpsys	37.75	2.00	5.6
SSAX	45.75	12.88	System Software Assoc.	40.88	5.25	14.7
SYSF	18.13	6.75	Systemsoft Corp.	15.25	-1.13	-6.9
VIEW	24.00	7.88	ViewLogic Systems	11.75	1.63	16.0
VMRK	21.50	6.25	VMark Software Inc.	7.50	0.38	5.3
WALK	9.75	4.63	Walker Interactive Systems	7.63	-0.50	-6.2
WALL	55.50	14.50	Wall Data Inc.	17.25	0.75	4.5
WANG	19.50	9.13	Wang Laboratories Inc.	16.88	0.38	2.3
Semiconductors					**OFF 4.58%**	
AMD	39.25	20.75	Advanced Micro Devices (L)	22.13	-0.75	-3.3
ADI	39.50	20.00	Analog Devices Inc.	38.00	0.25	0.7
ATML	36.75	15.38	Atmel Corp.	29.00	-1.50	-4.9
CHPS	15.88	5.88	Chips and Technologies	9.81	-0.31	-3.1
CRUS	61.13	10.50	Cirrus Logic	30.00	-10.63	-26.2
CY	27.75	10.50	Cypress Semiconductor Corp.	17.75	-0.38	-2.1
DS	24.88	13.75	Dallas Semiconductor	20.88	-0.88	-4.0
ISSS	34.25	12.00	Integrated Silicon Systems	30.00	-1.50	-4.8
INTC	78.38	28.75	Intel Corp.	68.63	-3.69	-5.1
LSI	62.50	18.25	LSI Logic Corp.	44.75	-2.38	-5.0
LSCC	43.00	15.81	Lattice Semiconductor	37.63	-1.13	-2.9
MU	94.75	19.38	Micron Technology	64.50	-3.88	-5.7
MOT	82.50	51.50	Motorola Inc.	68.00	0.25	0.4
NSM	33.63	16.50	National Semiconductor	23.63	-1.25	-5.0
SERA	28.75	6.63	Sierra Semiconductor	17.75	-2.75	-13.4
TXN	83.75	12.75	Texas Instruments	64.13	-1.88	-2.8
VLSI	39.13	10.63	VLSI Technology	21.50	-0.88	-3.9
WWTK	6.88	1.78	Weitek	4.25	0.13	3.0
WDC	22.13	13.13	Western Digital Corp.	16.75	0.88	5.5
XLNX	55.50	18.13	Xilinx	41.56	-2.69	-6.1
ZLG	54.13	32.00	Zilog Inc.	32.50	-2.63	-7.5
Peripherals and Subsystems					**OFF 2.59%**	
APCC	25.88	9.75	American Power Conversion	10.50	-0.50	-4.5
ADPT	47.25	19.88	Adaptec Inc.	43.75	-1.25	-2.8
BTEC	22.75	14.25	Banctec Inc.	19.63	-0.13	-0.6
CBEX	13.13	3.38	Cambex Corp.	8.63	-0.75	-8.0
CGN	6.38	1.38	Cognitronics Corp.	5.31	-0.31	-5.6
CNR	21.75	9.00	Conner Peripherals (H)	21.75	2.00	10.1
CREAF	14.38	5.88	Creative Technologies Inc.	10.13	-1.50	-12.9
RACE	13.13	3.50	Data Race Inc.	3.81	-0.19	-4.7
DTM	9.38	4.50	Dataram Corp.	7.88	-0.81	-9.4
EMC	27.38	13.00	EMC Corp.	17.88	-0.63	-3.4
EMLX	28.50	10.00	Emulex Corp.	15.63	-0.13	-0.6
ESCC	23.00	11.25	Evans & Sutherland	21.25	0.50	2.4
EXBT	24.00	10.00	Exabyte	13.50	0.38	2.9
IISLF	4.25	1.88	Intelligent Info. Systems	2.13	-0.50	-19.0
IOMG	32.38	2.88	Iomega Corp.	32.38	7.88	32.1
IPLSA	7.88	2.00	IPL Systems Inc.	3.50	-0.31	-8.2
KMAG	74.88	22.25	Komag Inc.	58.38	-2.63	-4.3
MXTR	7.25	3.63	Maxtor Corp.	6.31	0.00	0.0
MLIS	11.50	3.75	Micropolis Corp. (L)	3.75	-0.13	-3.2
MTSI	47.50	13.50	Micro Touch Systems Inc.	16.50	0.00	0.0
PEAK	31.75	14.00	Peak Technology Group	26.00	-0.63	-2.3
PNCL	27.00	8.75	Pinnacle Micro Inc.	26.13	0.75	3.0
PTNQ	38.75	13.75	Printronix Inc.	17.75	-1.13	-6.0
AQM	10.13	3.38	QMS Inc. (L)	3.38	-0.63	-15.6
QNTM	28.50	13.75	Quantum Corp.	19.50	0.63	3.3
RDUS	15.00	2.00	Radius Inc. (L)	2.75	-0.75	-21.4
SEG	51.75	22.88	Seagate Technology (H)	51.75	3.00	6.2
STK	33.25	17.88	Storage Technology	25.50	-1.00	-3.8
TEK	61.88	31.38	Tektronix Inc.	58.88	0.38	0.6
XRX	138.50	90.63	Xerox Corp.	131.75	0.88	0.7
Services					**OFF 0.34%**	
AMSY	30.50	15.13	American Mgmt. Systems (H)	30.25	1.13	3.9
AAC	2.63	0.31	Anacomp Inc. (L)	0.31	-0.06	-16.7
ANLY	33.00	18.00	Analysts Int'l.	30.00	0.75	2.6
AUD	73.88	52.50	Auto Data Processing	72.25	1.25	1.8
CATP	61.00	16.75	Cambridge Tech. Partners (H)	56.25	-2.88	-4.9
CEN	47.50	23.50	Ceridian Corp.	43.75	-0.50	-1.1
CDO	32.50	20.00	Comdisco Inc.	31.50	-0.25	-0.8
CHRZ	28.50	8.88	Computer Horizons (H)	28.50	1.50	5.6
CSC	71.38	45.00	Computer Sciences	71.38	3.13	4.6
TSK	17.75	7.50	Computer Task Group	17.75	0.38	2.2
CPU	44.38	12.25	CompUSA Inc.	38.50	-1.13	2.8
CDAT	16.25	5.38	Control Data Systems Inc. (H)	15.25	0.25	1.7
EGGS	14.25	6.63	Egghead Discount Software	7.56	0.31	4.3
GME	50.25	35.00	General Motors E (EDS) (H)	49.13	0.13	0.3
INAC	15.25	6.88	Inacom Corp.	10.88	0.75	7.4
INEL	15.75	7.25	Intelligent Electronics	7.75	-0.25	-3.1
MSEL	10.25	3.88	Merisel	5.63	-0.38	-6.3
MICA	15.00	8.13	Microage Inc.	8.25	-0.13	-1.5
PAYX	47.00	23.25	Paychex	42.25	-2.50	-5.6
PMS	54.25	37.75	Policy Management Sys.	46.00	-2.00	-4.2
REY	37.50	22.25	Reynolds and Reynolds (H)	36.50	-0.63	-1.7
SEIC	24.50	16.75	SEI Corp.	21.50	-0.75	-3.4
SMED	42.75	28.75	Shared Medical Systems	40.75	1.63	4.2
SHKIF	13.00	4.00	SHL Systemhouse	12.88	0.13	1.0
SSPE	26.50	14.00	Software Spectrum Inc.	20.75	-0.50	-2.4
SNDT	31.75	17.75	Sungard Data Systems	30.00	1.75	6.2

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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- Best New Network Management Product
- Best New Carrier Service
- Best New LAN and Internetworking Product
- Best New Switching Technology Product
- Best New Infrastructure Product
- Best New Multimedia and Desktop Product
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Computerworld

Hackers

CONTINUED FROM COVER 1

type DOS commands because they have no idea what they've broken in to."

For example, a new kind of "war dialer" — which automatically dials a range of phone numbers looking for hacking opportunities — features a point-and-click interface as user-friendly as any software in the market. Menus allow users to choose whether they want to hack into private branch exchanges, computer modems or long-distance carriers, according to Paul Renda, a data security technical consultant at Dean Witter Discover & Co. in New York. He demonstrated the software at the Computer Security Institute conference in Washington last week.

War dialers are frequently used against AMP, Inc., a manufacturing firm in New Harrisburg, Pa., said Scott Sattler, a computer security analyst at AMP. "They are posted all over the Internet now, and anyone can download them. It's a huge and growing problem," he said. The extent of the damage caused by the hacking is unknown. "You don't know until it's too late," he said.

Tool time

One new tool available in the past few months is "rootkit," a package of software utilities and documentation designed to walk the fledgling pirate through taking over a target machine.

Another tool, a command-line Unix utility released this fall, automates IP spoofing, the attack method favored by famed criminal hacker Kevin Mitnick. And there are at least two graphical tool benches for writing PC viruses — the Virus Creation Laboratory and Phalcon/Skism Mass-Produced Code Generator.

The best protection is knowledge, the experts agreed. Users should stay up to date on security journals, newsgroups and training. There is also "attack scanning" software, such as Pingware from Bellcore and Internet Security Scanner from Internet Security Systems, Inc. in Norcross, Ga. — both of which automatically scan systems and produce reports showing where security holes need to be plugged.

Another attack scanning utility, the Security Analysis Tool for Auditing Networks (SATAN), was posted as freeware on the Internet earlier this year, prompting fears that it could be used as an automated, graphical hacking tool (see story at left).

But SATAN should be employed as a friend, said Peter Tippett, president of the National Computer Security Institute in Carlisle, Pa. "I know lots of companies that have been [attacked by] SATAN," he said. "Most of them have got a copy of SATAN and tried it on themselves, and maybe a third of them have found vulnerabilities with it."

Automated crime defenses

The following are weapons for the war on automated crime announced last week at the Computer Security Institute conference in Washington:

Vendor/Product	Description	Availability	Price
Axent Technologies Rockville, Md. *OmniGurar/Intruder Alert Release 2.1*	For intrusion detection. Uses rules-based anomaly detection to identify suspicious behavior on client/server networks.	Now	$1,995 (server); $995 (client)
Internet Security Systems Norcross, Ga. *Internet Scanner*	Tests for file-and-print sharing vulnerabilities in TCP/IP networks running Microsoft's Windows 95, Windows NT or Windows for Workgroups.	Late next month	$20 to $80 per computer scanned
Intrusion Detection New York *Kane Security Analyst*	Audits Windows NT networks. Uses expert rules to compare LAN setup with industry best practices.	This month	Not yet announced
Spanning Tree Technologies Ames, Iowa *NetProbe*	Tests for the recently discovered "Telnet" vulnerability	Now	$10 to $125 per computer scanned

Devil in the details

Donn B. Parker, an information security consultant at SRI International in Menlo Park, Calif., said software tools such as SATAN will be the foundation of shrink-wrapped, fully automated computer crime kits.

Scanners such as SATAN can be used as a front end to find system vulnerabilities that can be exploited by add-on programs.

"There are malicious people out there writing automated crime programs," Parker said. "They're saying, 'Why end SATAN with a report? Why don't we add another program that exploits what SATAN finds?'"

At the Computer Security Institute conference last week, Parker explained how an attack scanner could be extended to plant rogue code in accounts payable systems to generate checks made out to a hacker and then erase all traces of itself.

Within three years, Parker said, hacking tools will be available that will automatically search the Internet and other networks for targets, select systems to break in to, steal information or money and then cover their tracks. All users will need to do is install the software and click on an icon to run.

But by that time, sophisticated and automatic defense tools also will be available, Parker noted.

— Gary H. Anthes and Mitch Wagner

PC Server Central

CONTINUED FROM COVER 1

software," said Carl Carrie, vice president of capital markets technology at Tullett & Tokyo Forex, Inc., an international foreign exchange derivatives and brokerage firm in New York with 3,000 users worldwide.

Carrie said the DSMN utility alleviated many of Tullett & Forex's worst network management woes.

"Instead of having to maintain separate log-ons and passwords for users, we now just have one," he said. "DSMN has made our hybrid environment appear homogeneous, so we now need far fewer managers to monitor the network, and we're not spending nearly as much time in training classes."

Another user, Bill Storey, a managing partner at Wells & Storey, an independent software consulting and integration concern in Wolfeboro, N.H., agreed.

"If there's any type of problem with the NetSync NLM, it will impact the core NetWare network operating system," Storey said. "That's not the case with DSMN. If a problem occurs, it doesn't crash or bog down the NT file server."

Directory Service Manager for NetWare will provide the following capabilities:

- Workstation users can access NetWare and Windows NT through a single log-on
- End users can access application services on Windows NT Server without changing client software
- Network managers can manage NetWare users and group accounts from Windows NT Server Directory Services

Microsoft's other utilities that link the NetWare and Windows NT Server environments include the IPX-Compatible Transport Stack, the Gateway Service for NetWare, the Migration Tool for NetWare and File and Print Services for NetWare.

"Microsoft is playing its cards exactly right. The more connectivity it forges between the NetWare and Windows NT Server environments, the easier it will be to sell NT Server and eventually lure many users — especially in data-intensive financial shops — away from NetWare altogether," said Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston.

"The bottom line for my company is that Windows NT Server makes everything from installation, management and now integration of heterogeneous networks much easier than anything Novell has done," Carrie said.

Novell ships beta of NetWare Client for Windows 95. See page 60.

Farewell AppWare

Novell is in active discussions with several potential suitors to find a buyer for its long-maligned AppWare Tools Group, *Computerworld* has learned.

Its applications business, the former WordPerfect Corp., is also for sale.

While stressing that Novell is "still committed to supporting" AppWare, Joe Firmage, vice president of strategic planning at the NetWare Network Operating Systems division, said he expects the AppWare group to be sold in the next few months.

"I never understood the AppWare strategy and never met anyone who did," said Ki Wilson, a senior microcomputer analyst at Stone Container Corp. in Chicago.

Novell's original intent was to promote AppWare as the foundation for all cross-platform development. AppWare included AppWare Foundation and Visual AppBuilder, a fifth-generation language object-oriented programming environment.

Last November, Novell killed AppWare Foundation after it failed to garner support from many independent software vendors. But until last week, Novell insisted that the rest of the AppWare initiative was continuing.

— Laura DiDio

Microsoft's instincts aren't right to profit from 'net

Charles Babcock

To me, Microsoft sounds a little defensive about the Internet these days.

Microsoft keeps saying it has a set of products that it is preparing for the 'net. A few are already out, and others will emerge next year. More are in the works for a later release. But the Internet's universe is expanding at the speed of light — with little Microsoft assistance. Unlike the PC revolution, the dawning of the 'net is outside Microsoft's frame of reference and its core — proprietary — culture.

The Microsoft Network (MSN) will function as a gateway to the Internet for Windows 95 users, but the MSN's on-line service remains skimpy, with many of its rooms still labeled "under construction." Maybe the construction team still feels the eyes of the Justice Department scrutinizing its drywall.

Microsoft is reportedly working on Blackbird, a language for building home pages on the World Wide Web. But, so far, the company hasn't said much about it. This is a little like IBM offering its own version of Microsoft's Visual Basic. Who needs it when the original is just fine? Is Blackbird going to supplant Hypertext Markup Language (HTML) and Sun's Java as the language of choice for companies that want a presence on the Web? If it is, it had better hurry. Twenty thousand companies a month add their sites to the Web without help from Microsoft.

All of those hard-to-quantify factors that help a company become a big success in one arena don't seem to be operating for Microsoft with the Internet. One of the hardest to quantify is leadership, or the sense that the personality of the company is in the forefront of an emerging mass phenomenon, which Microsoft had with the rise of IBM PC-compatible computing.

But the Internet clearly isn't peripheral to the desktop revolution. It has different roots and a different impetus. Whether a company such as Microsoft will lead this muscular, new expression of computing is doubtful.

As it is, Microsoft must support the leadership of Netscape Communications, which not only uses HTML in its products, but also adds extensions that other parties must keep up with. By some reports, Microsoft's Windows 95 Web browser, Explorer, doesn't faithfully display some of the pages it encounters.

Can Microsoft follow as effectively as it leads with so much of the Internet being established without its help? Will Microsoft honor standards that it didn't have a hand in establishing?

Culturally, Microsoft is best at supporting the standards that its products have set. It will follow existing standards if they were there before its products. But Microsoft is neutral to the point of latent hostility toward embryonic standards, such as the Common Object Request Broker Architecture, when they may be competitors of any of its favored technologies.

Can Microsoft contribute technology to an Internet that defies proprietary strategies? Microsoft drove down the price of computing by dominating operating systems and then offering interlocking products. And in doing so, it made much more power available to the masses. But it was still a proprietary strategy.

The Internet, with its public sector roots, operates on the presumption that the basic service and end-user access product are free, and only the parties generating massive followings will be rewarded with the opportunity to charge for services. Where is Microsoft's following on the 'net?

The Internet also more closely follows the principles of the Unix community, which honors enough open standards to achieve noninterlocking product sets. To date, Unix developers have shared knowledge of the operating system across a variety of companies.

With the Internet, we move much closer to a nonproprietary world where access is granted to all and profits are given to few. Microsoft isn't going to like this world if one day it cuts into its proprietary business. And right now, Microsoft is scratching its head and reacting with little genuine enthusiasm to the opportunities that the 'net offers.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

The Meta View

The Internet's universe is expanding at the speed of light — with little Microsoft assistance.

Inside Lines

It's a computer! No, it's a boy!

Sun Microsystems' release Nov. 7 of its UltraSPARC workstations coincided with the birth of CEO Scott McNealy's first child. Maverick Scott McNealy arrived just minutes after the UltraSPARC machines did. He weighed 6 lbs., 4 oz., was 21 inches tall and managed to make dad miss the product launch. "Leave it to Scott to upstage our event with his event," joked Ed Zander, president of Sun's hardware unit.

Hold the whips and chains

AT&T is pushing multimedia, touting the benefits of videoconferencing to conduct delicate long-distance negotiations. The argument is that there is no substitute for being able to stare down an adversary, to observe every twitch, every grimace. An AT&T marketeer called such face-to-face meetings "eye bondage."

Not nice to nuke your Notes users!

Talk about power. Lotus Notes administrators can now wipe out any trace of a user on an enterprise's Notes databases with a "Nuke User" button in Brainstorm Technologies' ServerAdmin Plus 1.5 for Notes.

Or is it?

Then again, sometimes you have to take a firmer hand, according to the CIA. At a session on Notes security last week at the Computer Security Institute conference in Washington, debate ensued about how to reliably remove users from Notes after they have left the company. "We kill them," quipped session co-chair Carl Schwab, a senior scientist at the spy agency.

We're a happy family

The software deep-thinkers at IBM are trying to figure out how to combine their long-promised, but still pending, knockoff of Microsoft's Visual Basic (dubbed Bart) with LotusScript scripting language. Lotus is embedding LotusScript in Notes 4.0 and SmartSuite. Adding pieces of LotusScript to Bart could enable Bart to emulate the stand-alone Visual Basic and Visual Basic for Applications. IBM confirmed it is evaluating a Bart/LotusScript mind meld. A decision is perhaps just weeks away.

The 5th Wave by Rich Tennant

"We're concerned - Kyle doesn't seem to be able to hot key between apps like all the other children."

A Vine still twines in Westboro

Despite Banyan Systems' recent financial woes, there will always be a Vines network operating system. John Paul, senior vice president of the Internet Products Division, said the Westboro, Mass., firm will release "at least three new versions" of Vines next year.

Dilbert would be so proud

With so many help wanted ads and simple search engines on the Internet, it's easy to conduct a job hunt from your PC. Of course, your current employer may not be so keen on the idea. That's why the on-line version of *The Boston Globe* includes a "hide" button for its classified section. Users can hit "hide" when the boss saunters by, and instantly a screen of what looks like lines of code appears.

War of the whoops

Sorry folks, but we goofed when we published the URL for Los Angeles-based *Internet Outfitters'* Internet broadcast of the original "War of the Worlds" radio show in this space Oct. 23. The correct URL is http://waroftheworlds.com. The broadcast runs through the end of this month.

Microsoft Chairman Bill Gates has added another accolade to the pile — this one for his lips. That's right. Blistex awarded him one of its "World's Most Beautiful Lips" awards for 1995, this one for "Most Micro-Soft Lips." If you've got something to be lippy about — like news items or story tips — contact Computerworld *via our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.*

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DEPARTMENTAL MANAGEMENT
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Dist./ Retailer
95. Other_____ (Please Specify)

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22. Dir./Mgr.: Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin Svs.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgt.
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OTHER PROFESSIONAL MANAGEMENT
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
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